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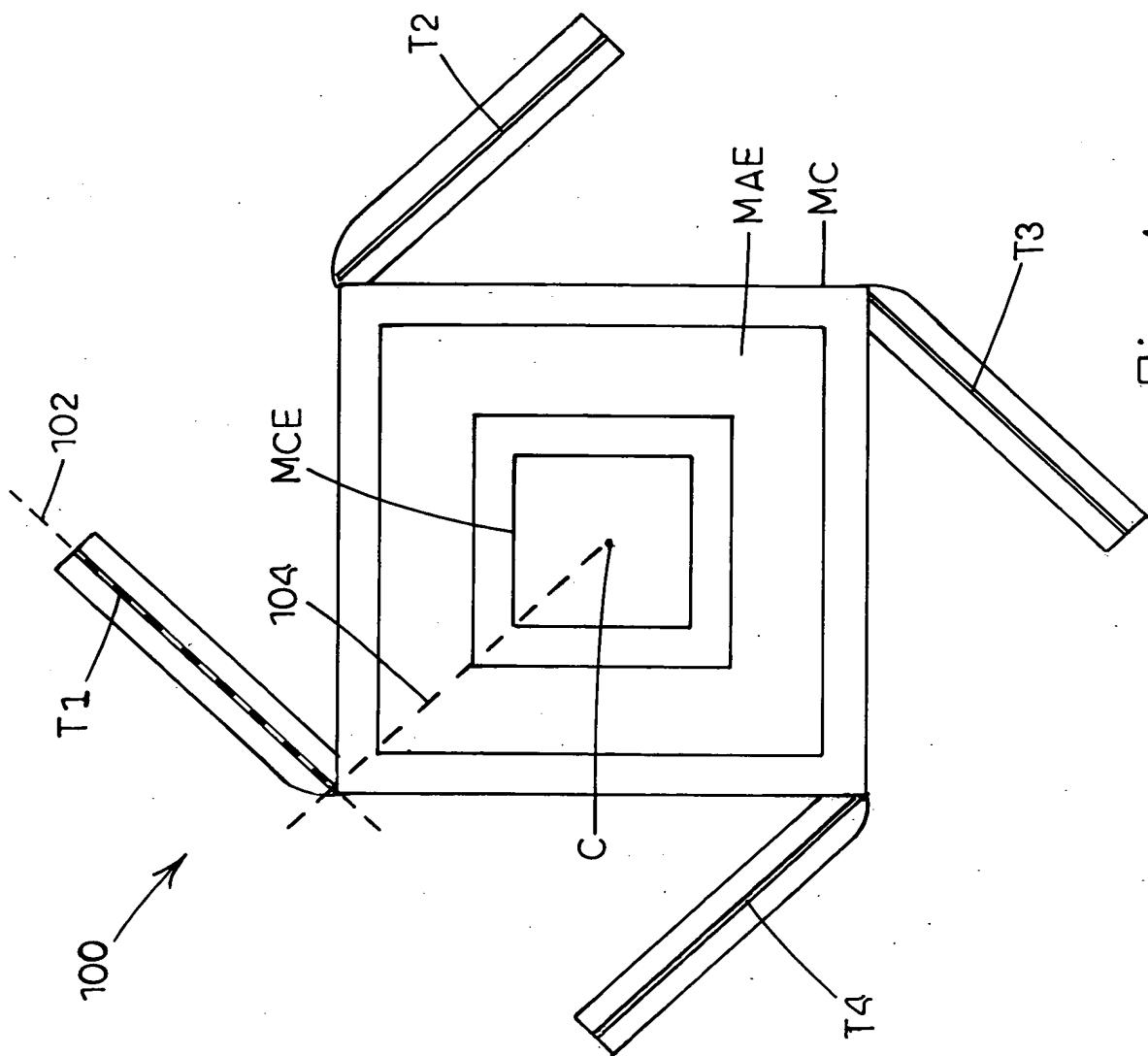


Fig. 1

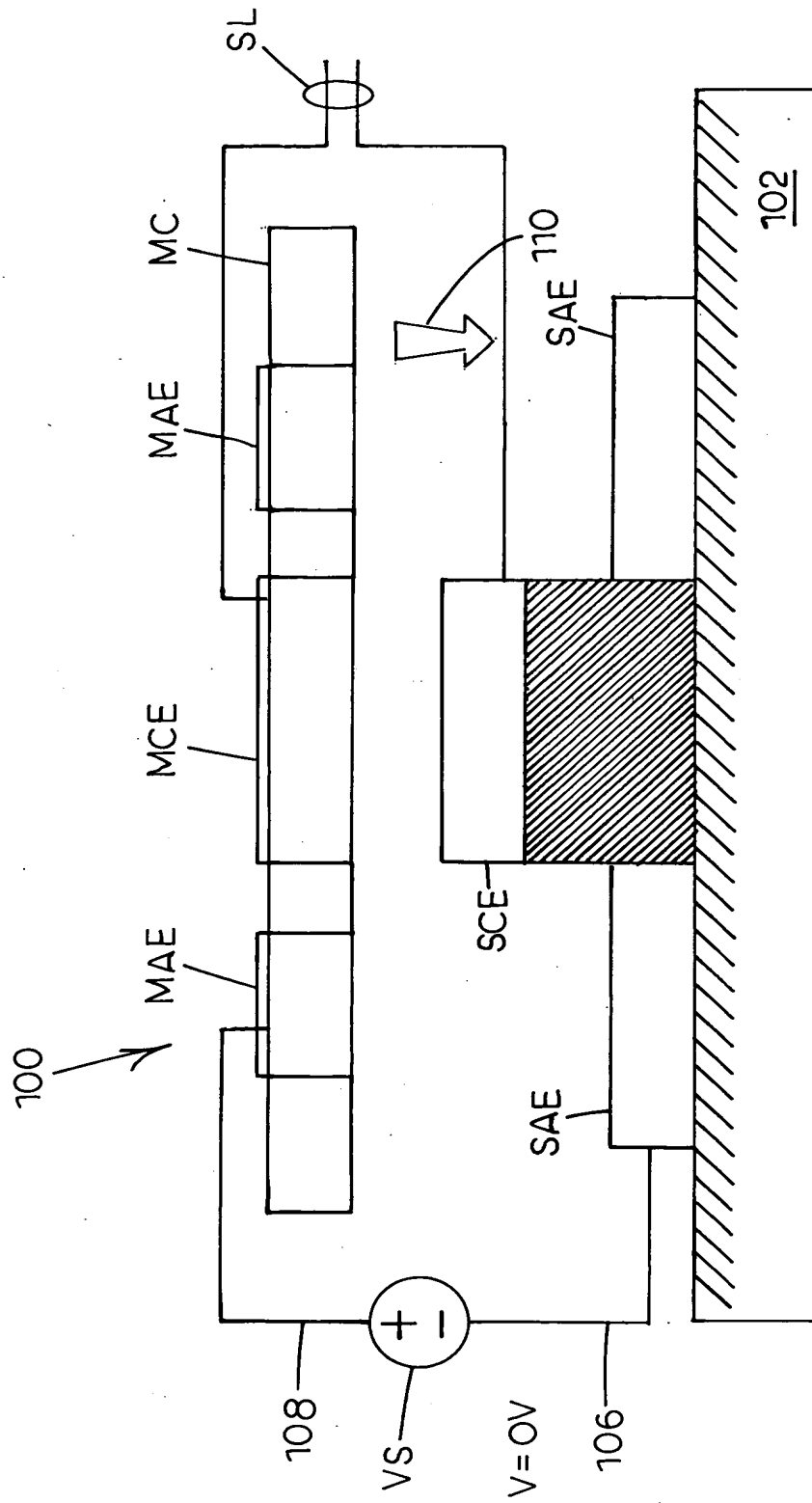


FIG. 2A

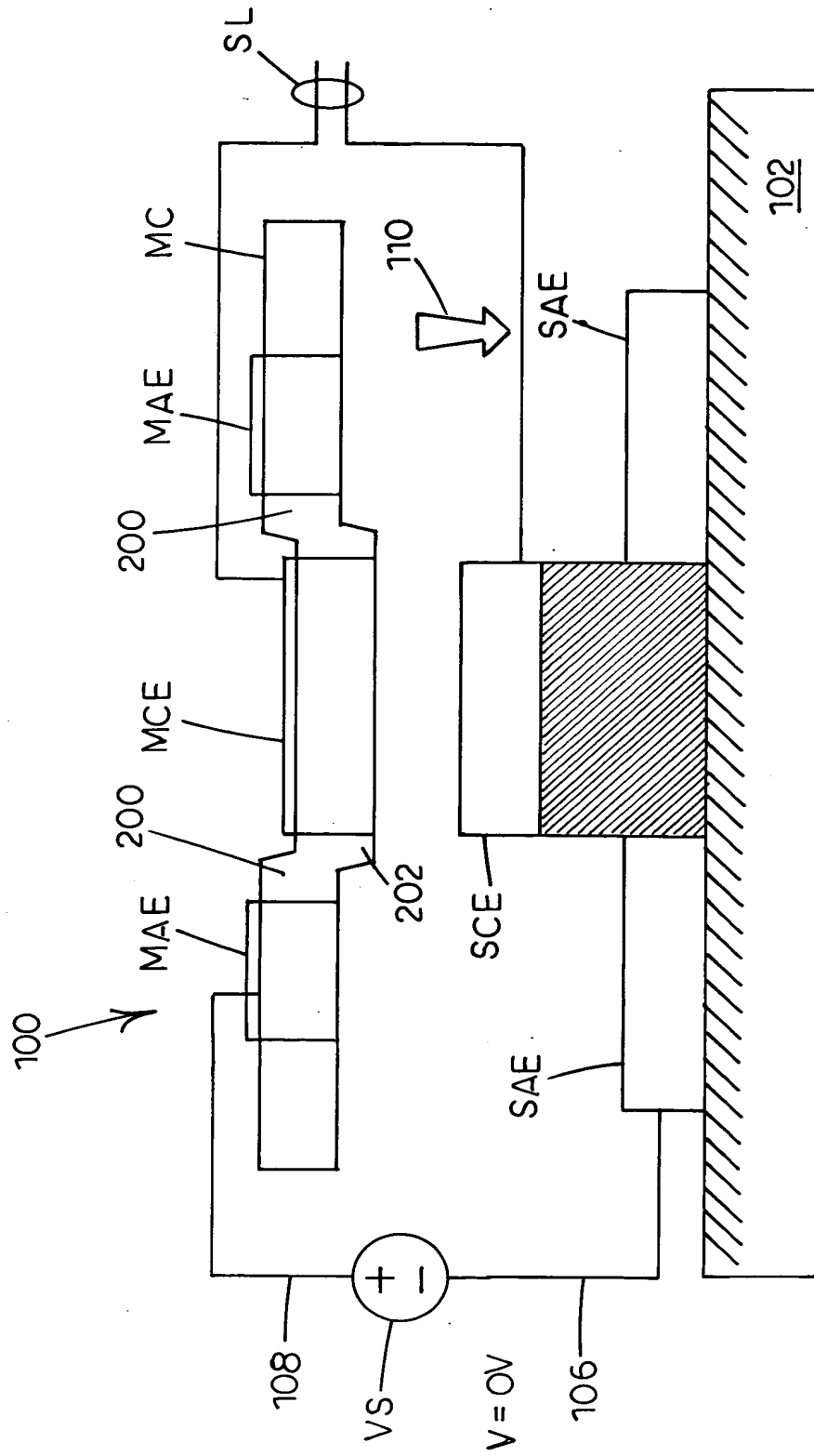


Fig. 2B

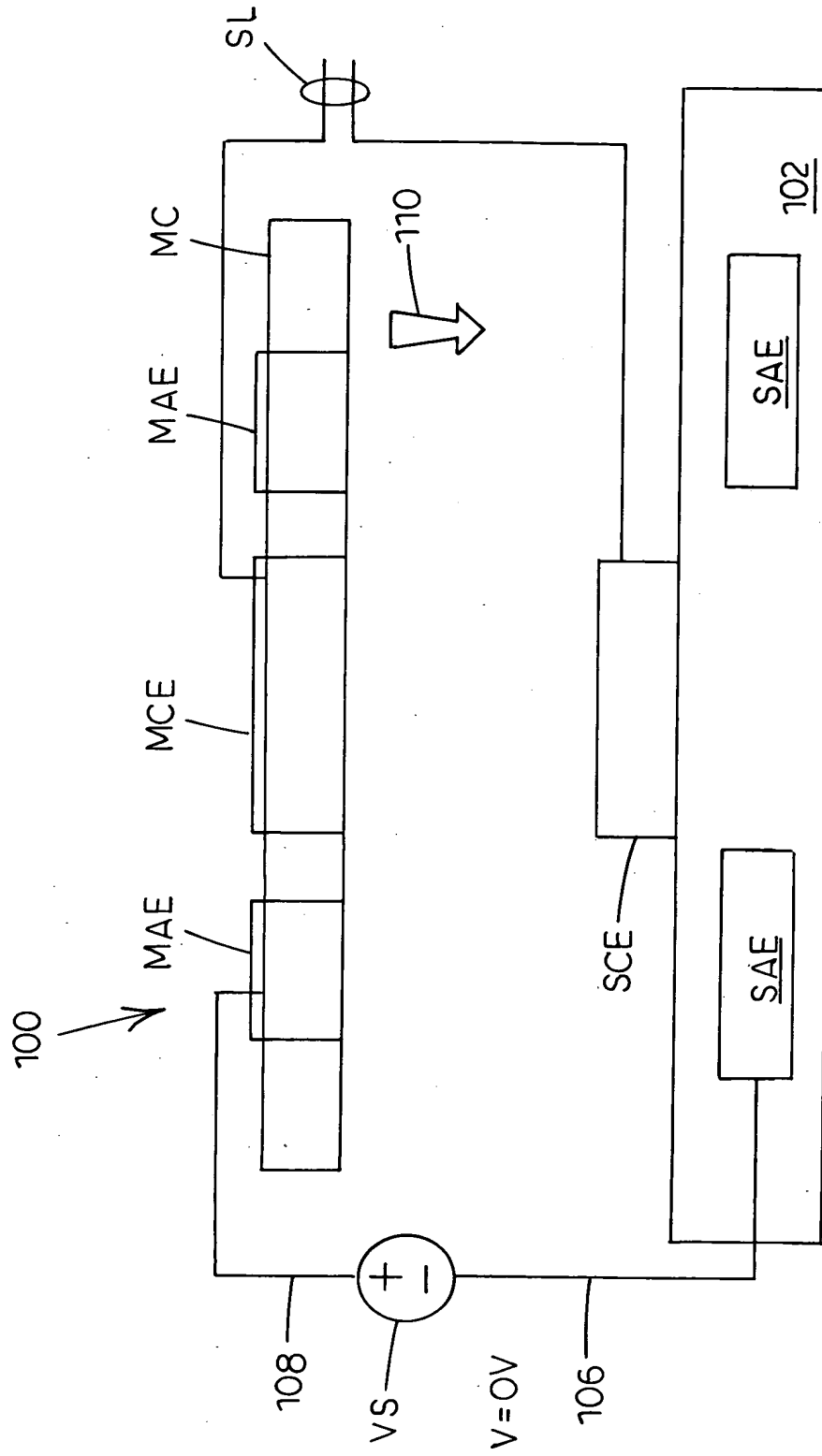


Fig. 2C

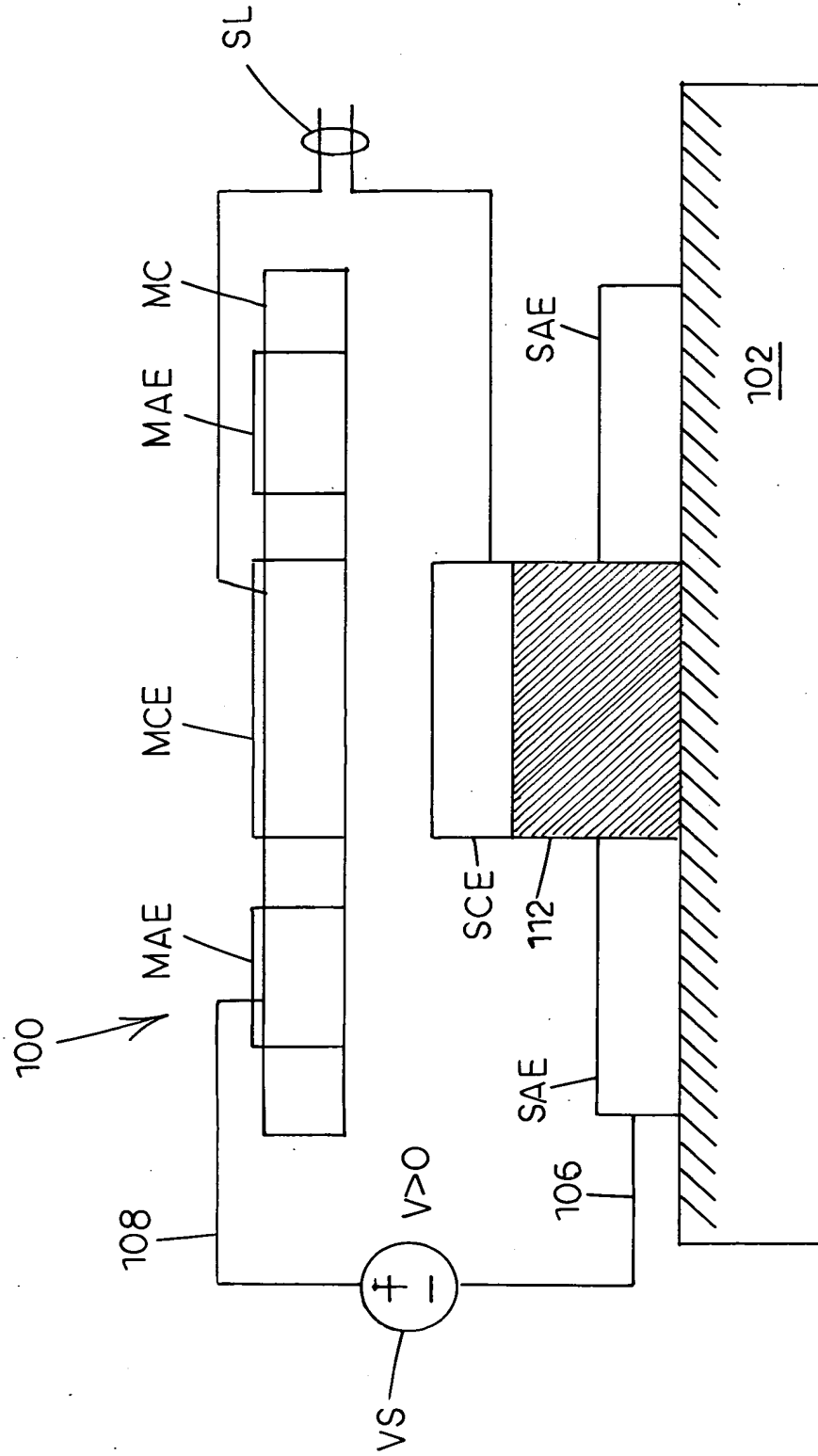
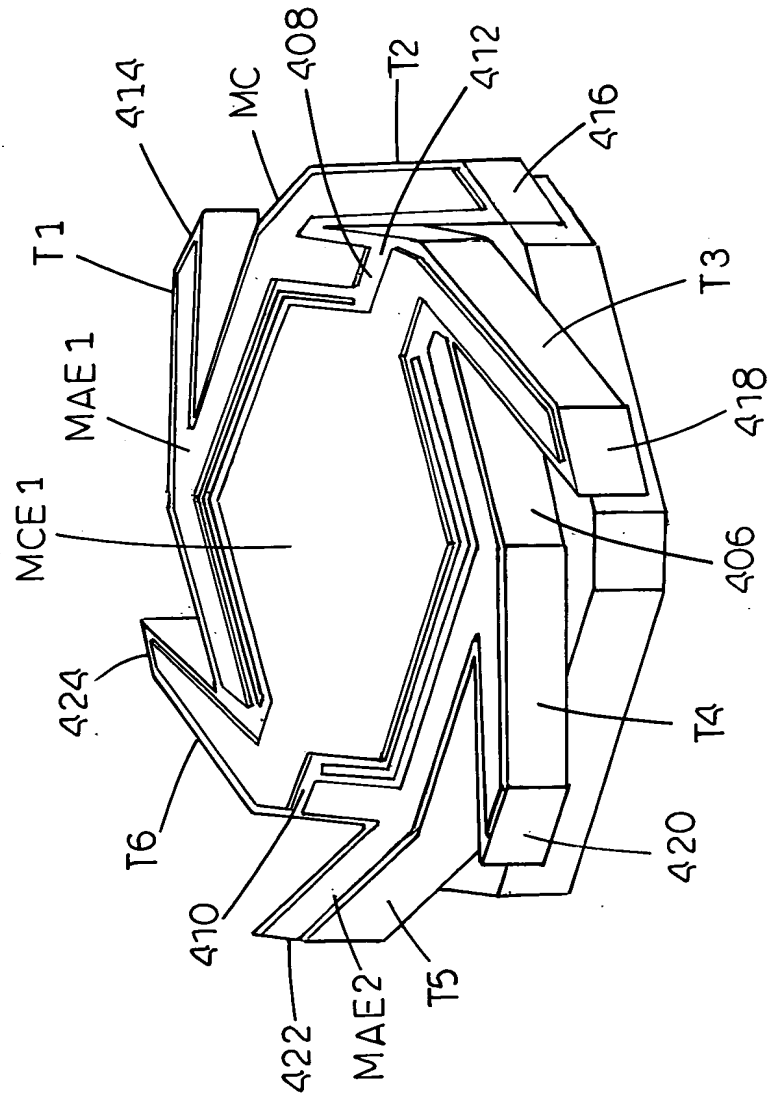


Fig. 3



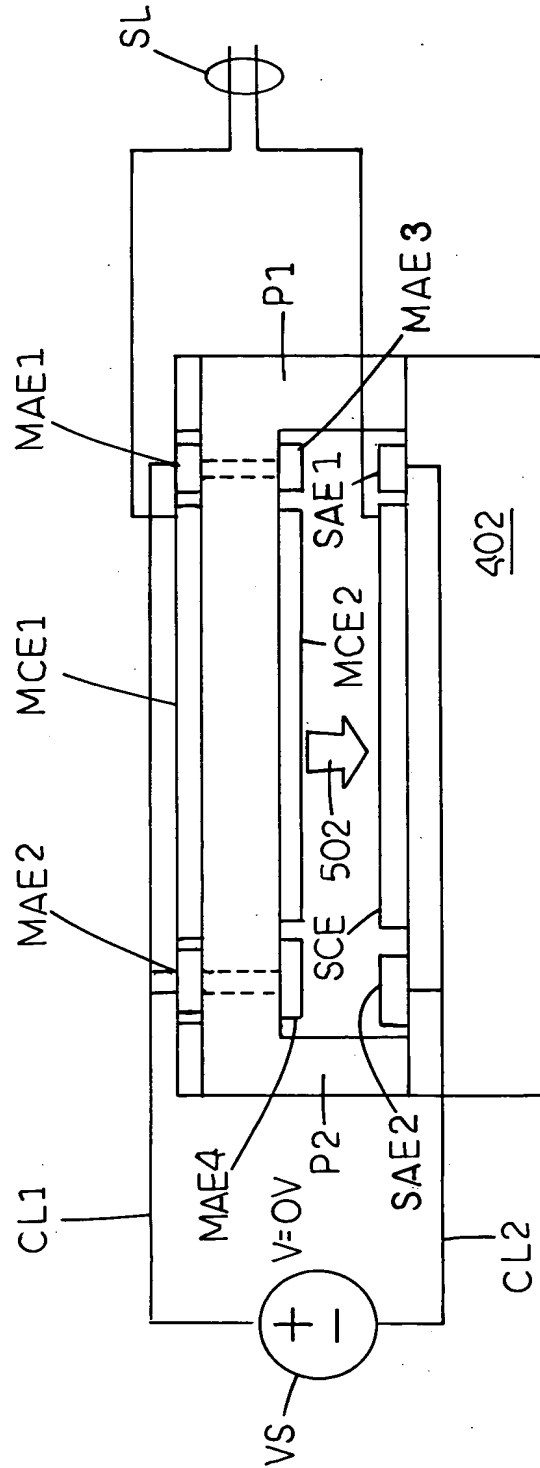


Fig. 5

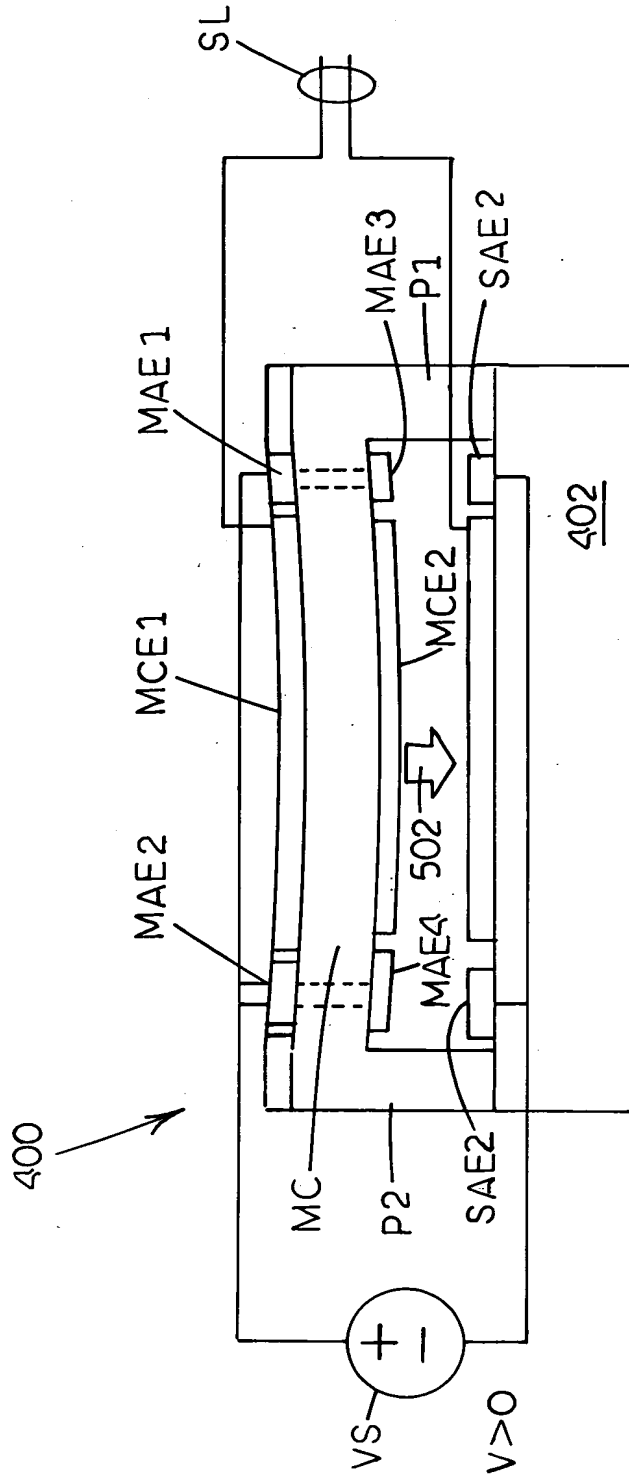
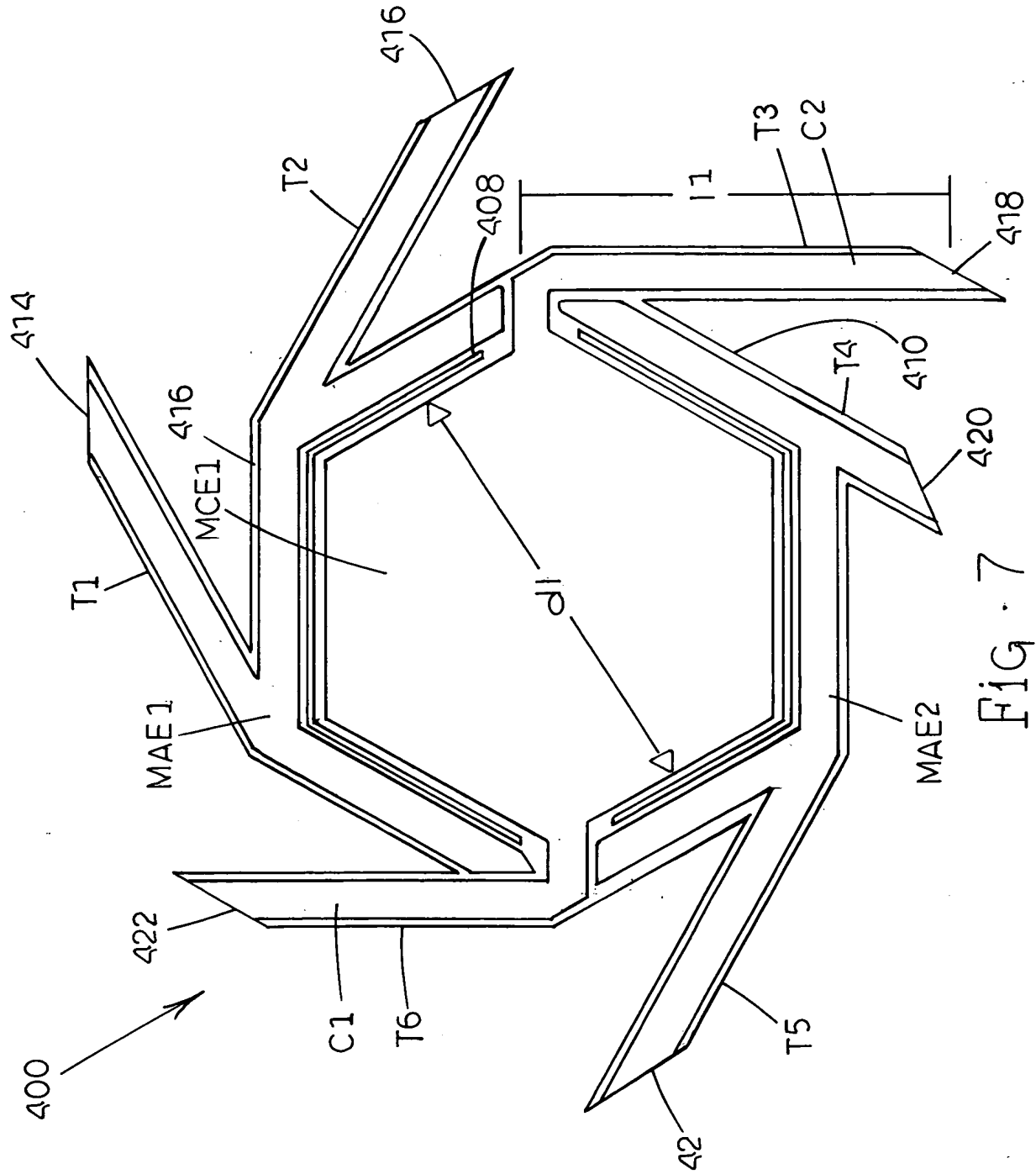


Fig. 6



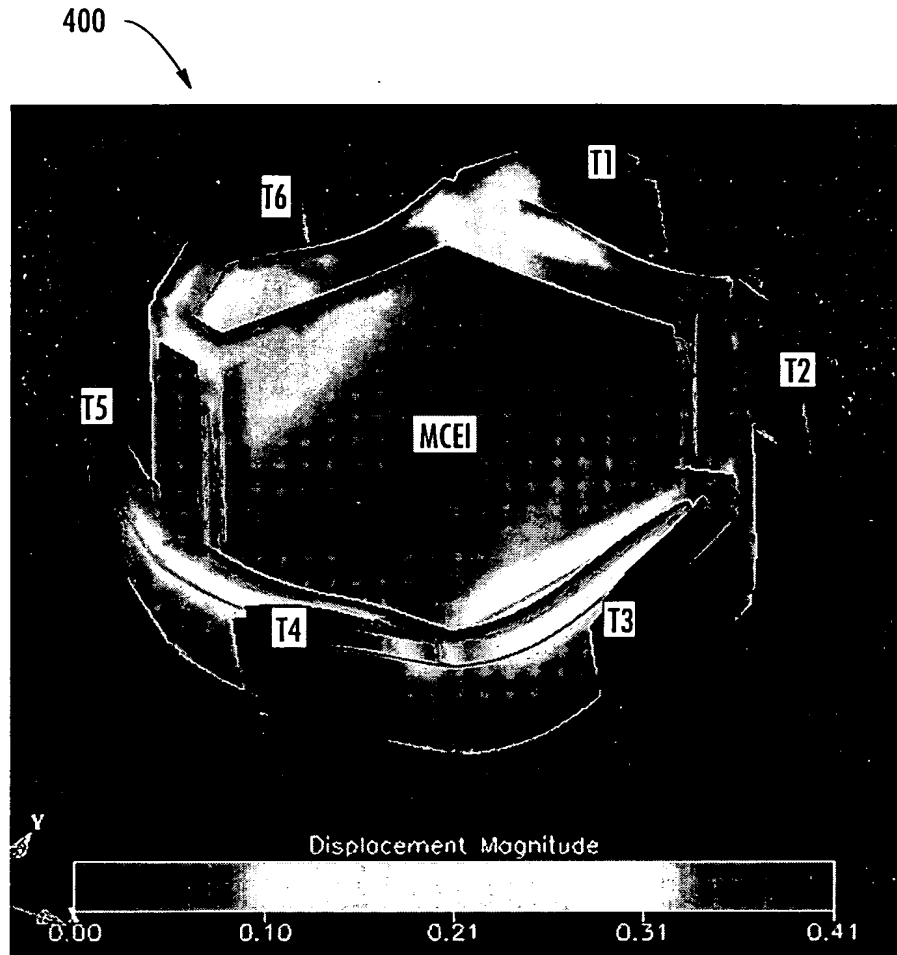


FIG. 8

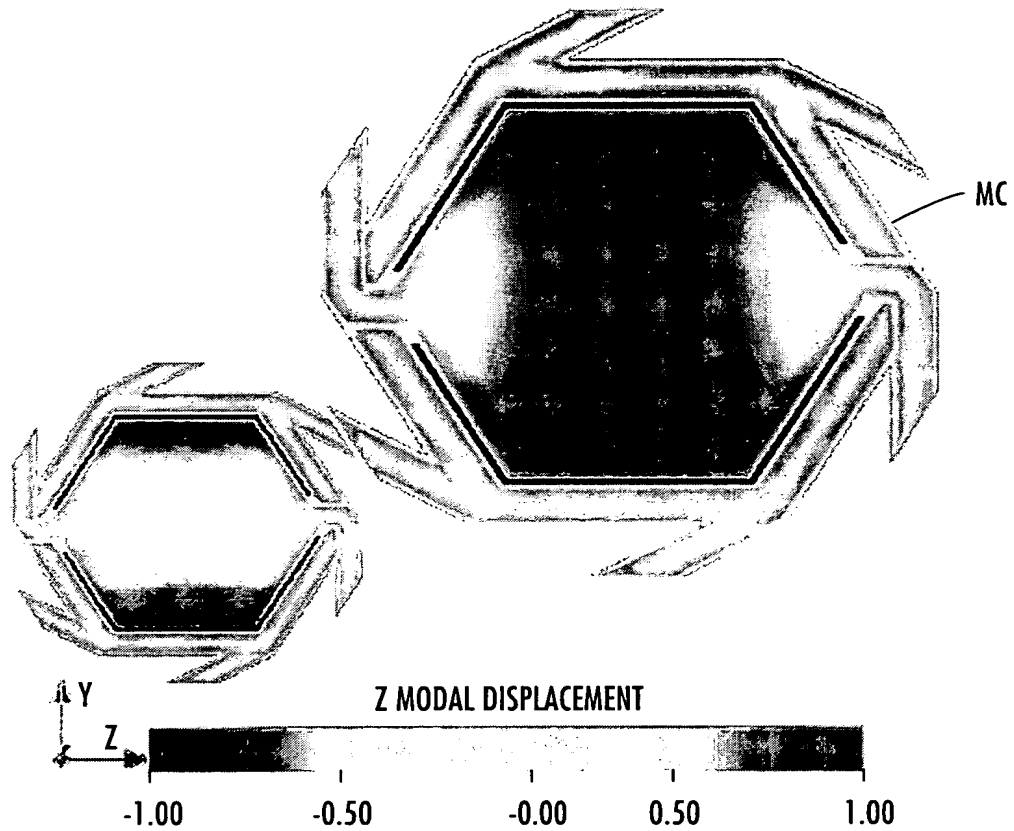


FIG. 9

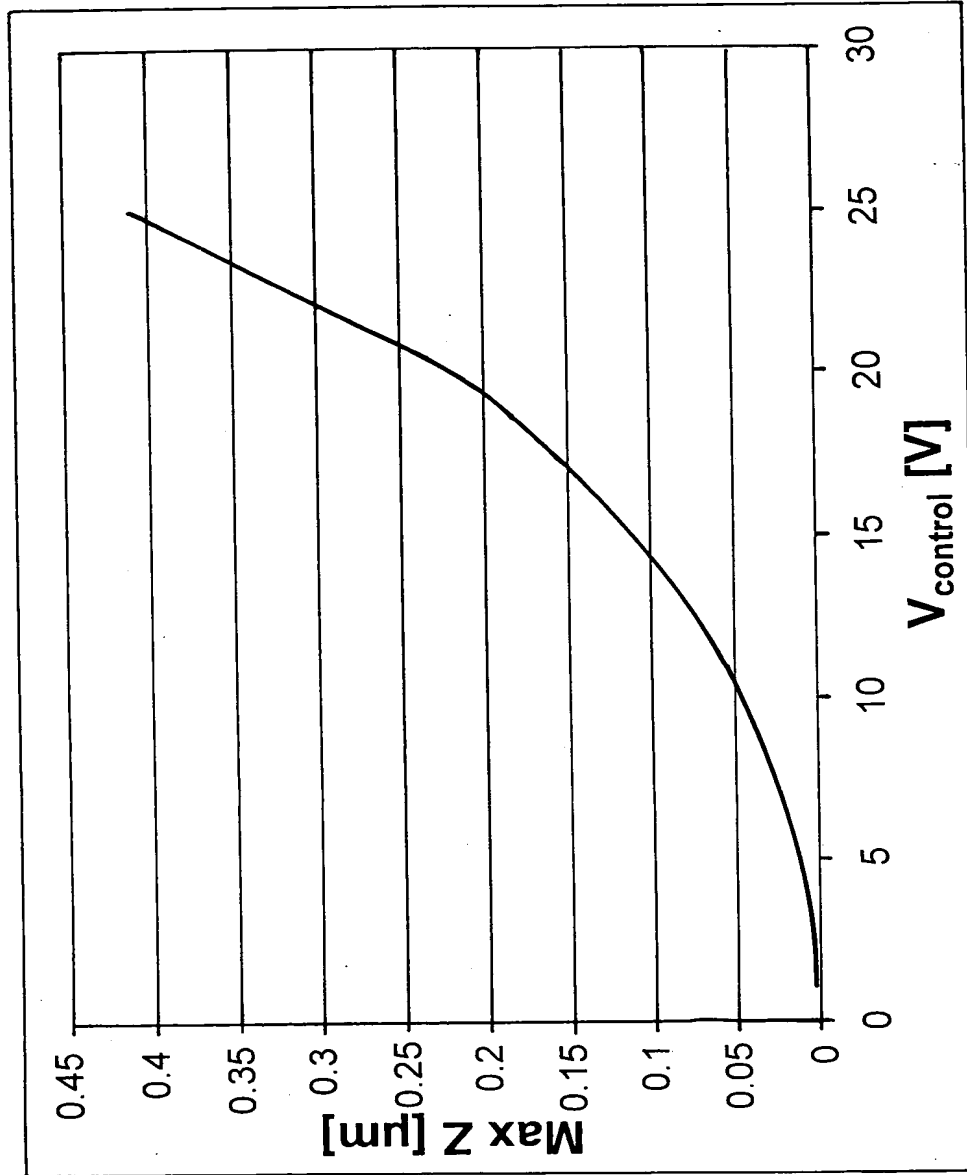


Fig. 10

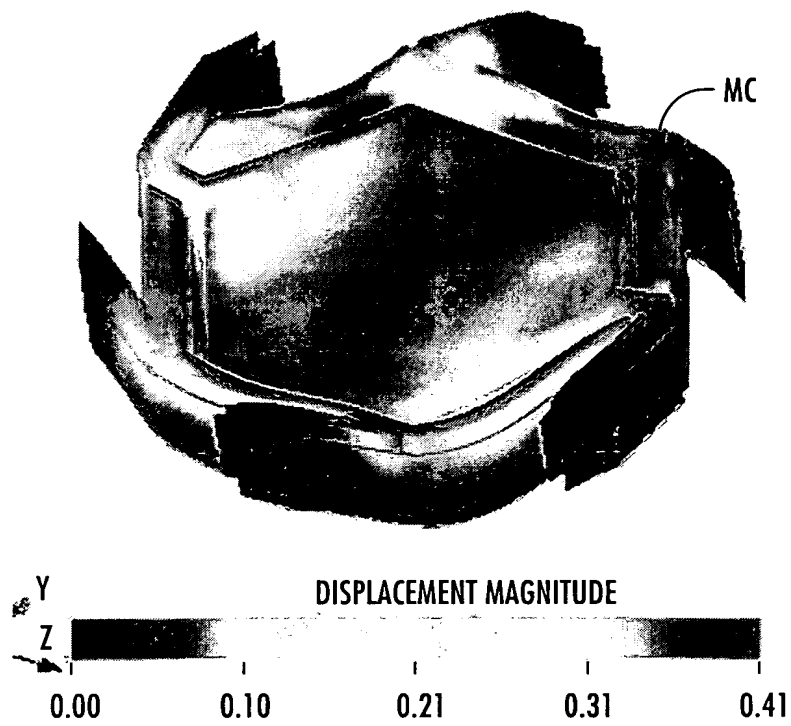


FIG. 11

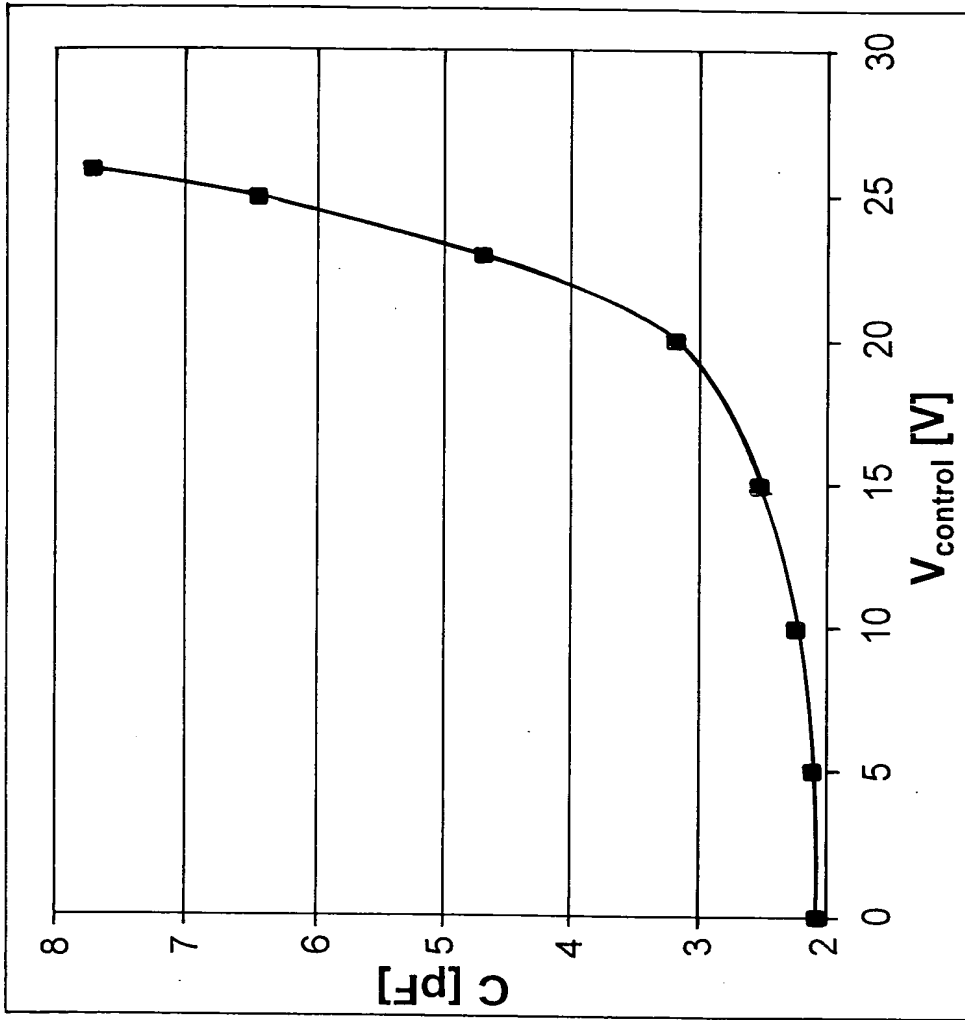


Fig. 12

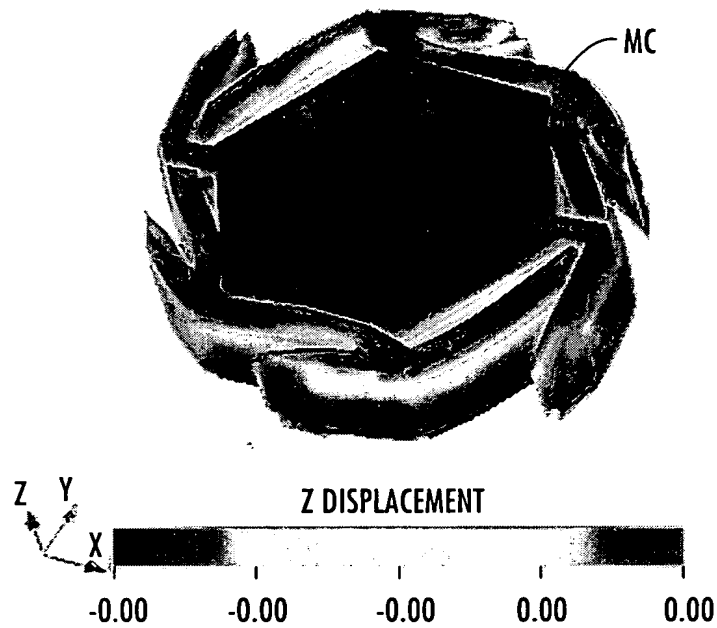


FIG. 13A

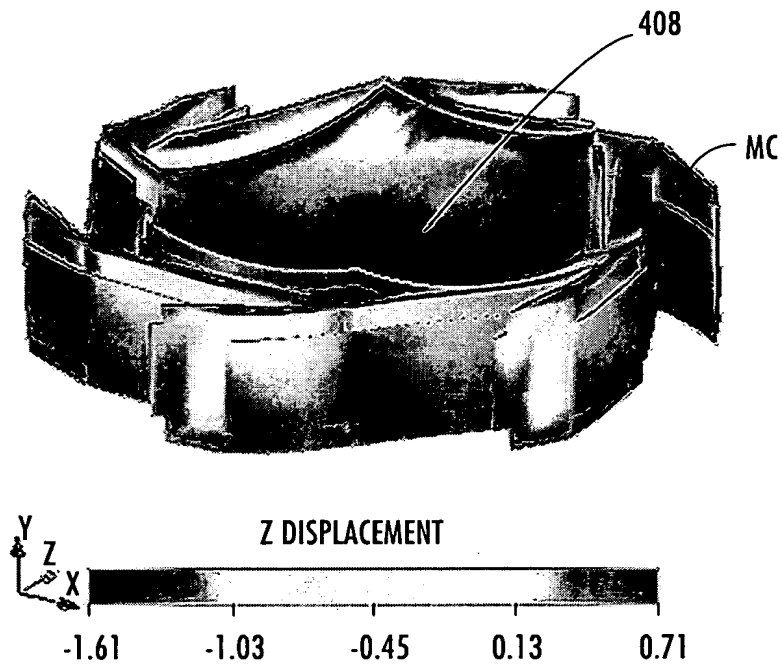


FIG. 13B

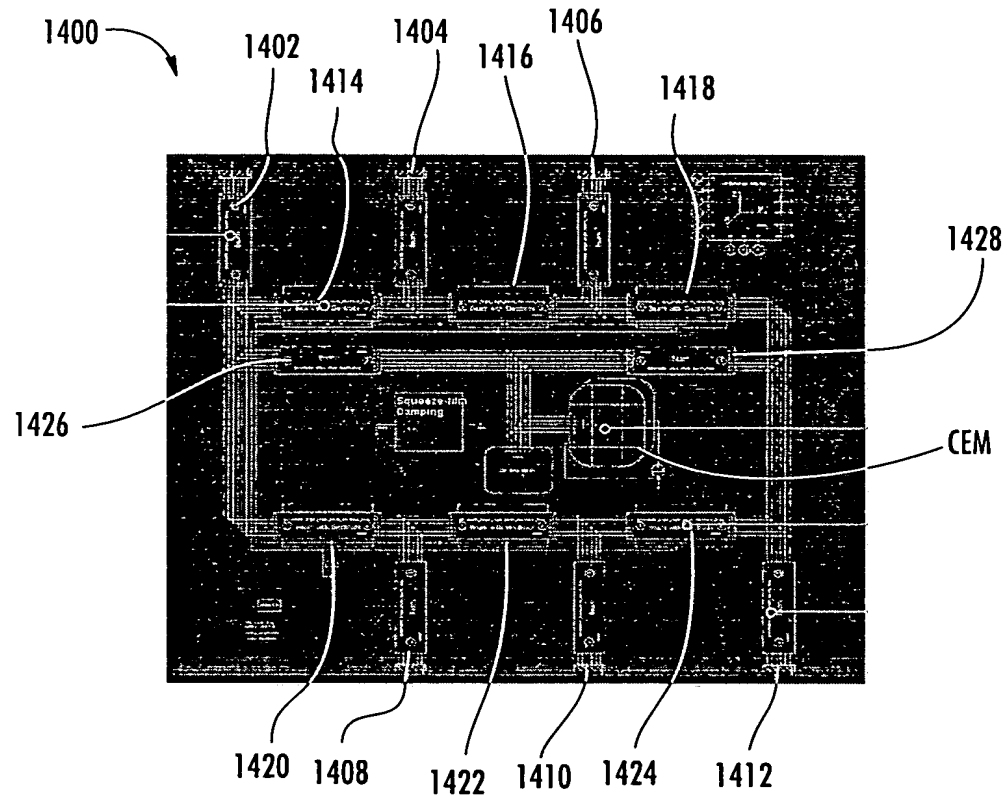


FIG. 14

FIG. 15A

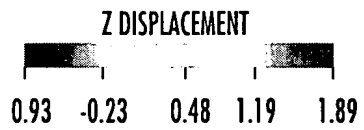
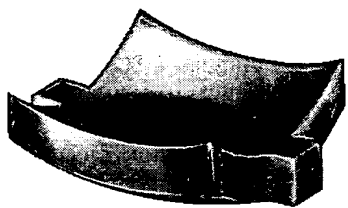


FIG. 15B

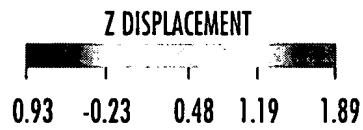
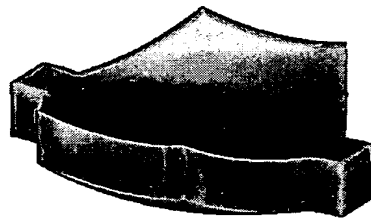
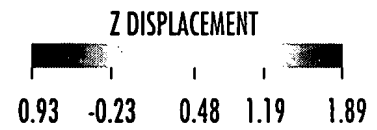
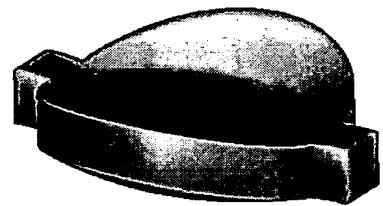


FIG. 15C



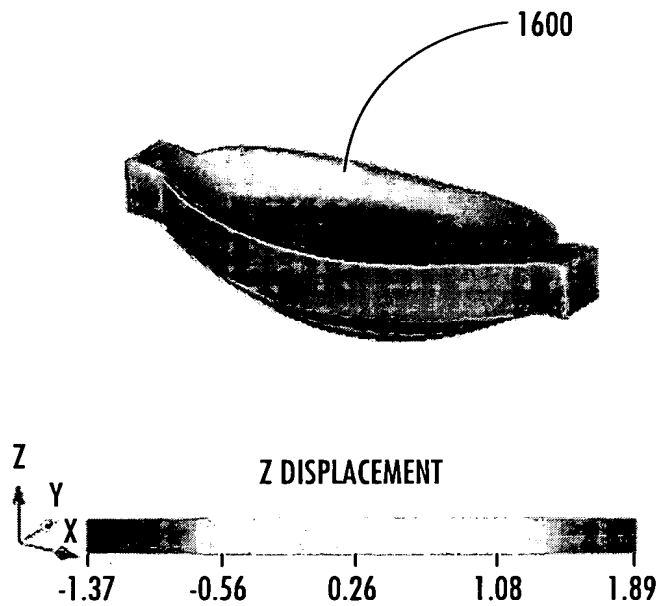


FIG. 16

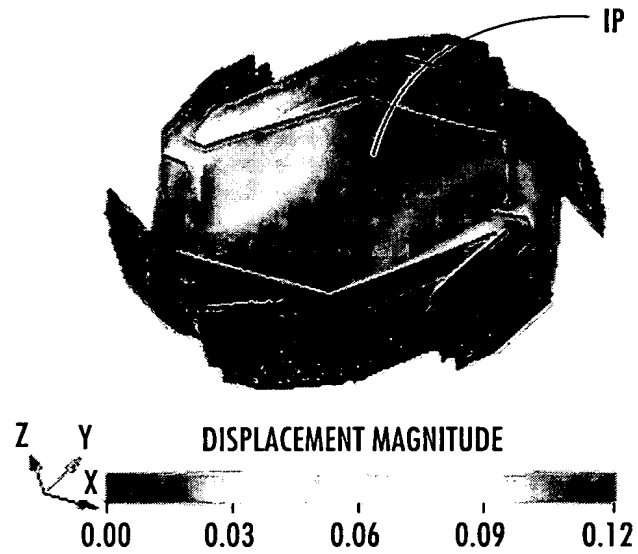


FIG. 17

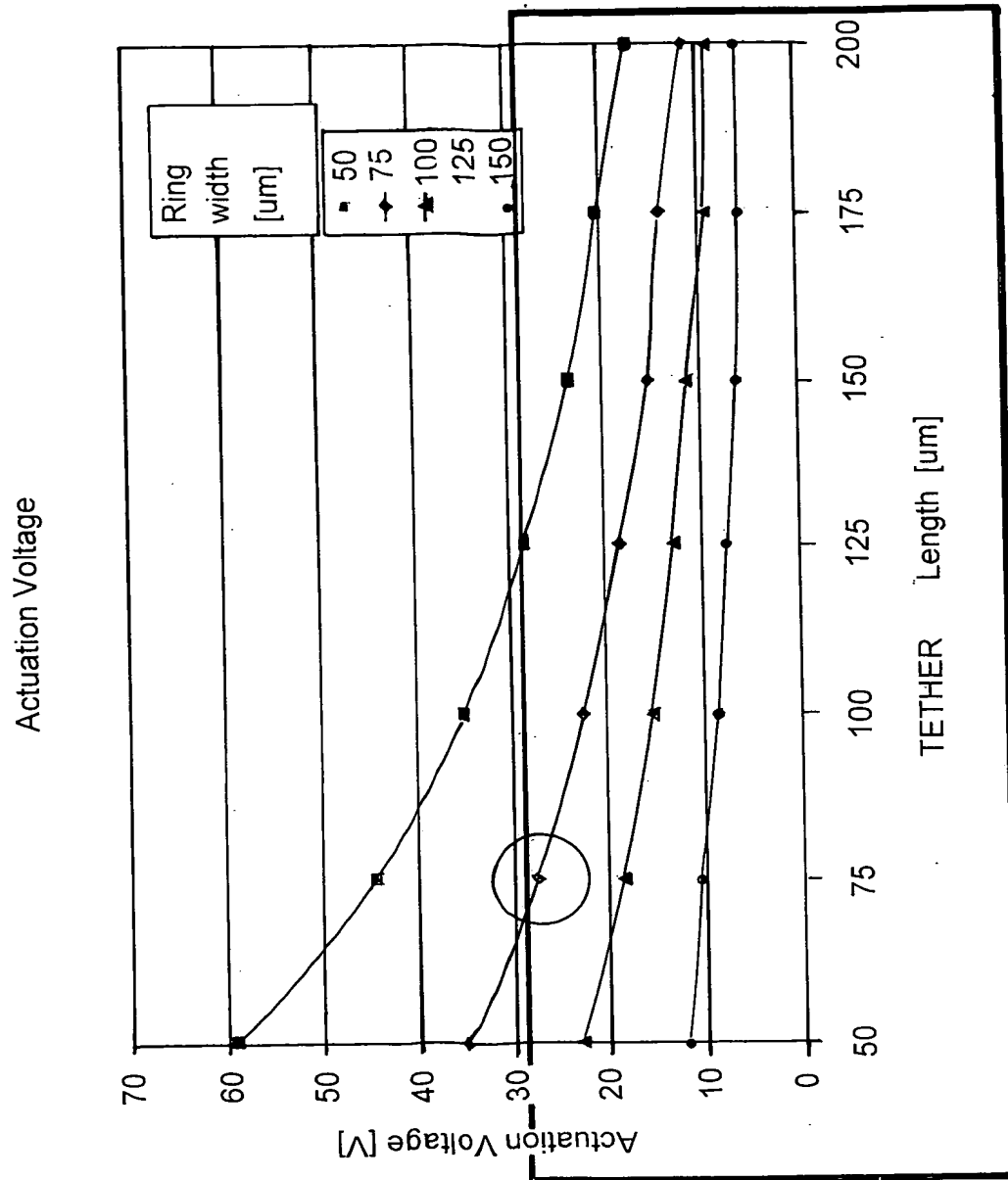


Fig. 18

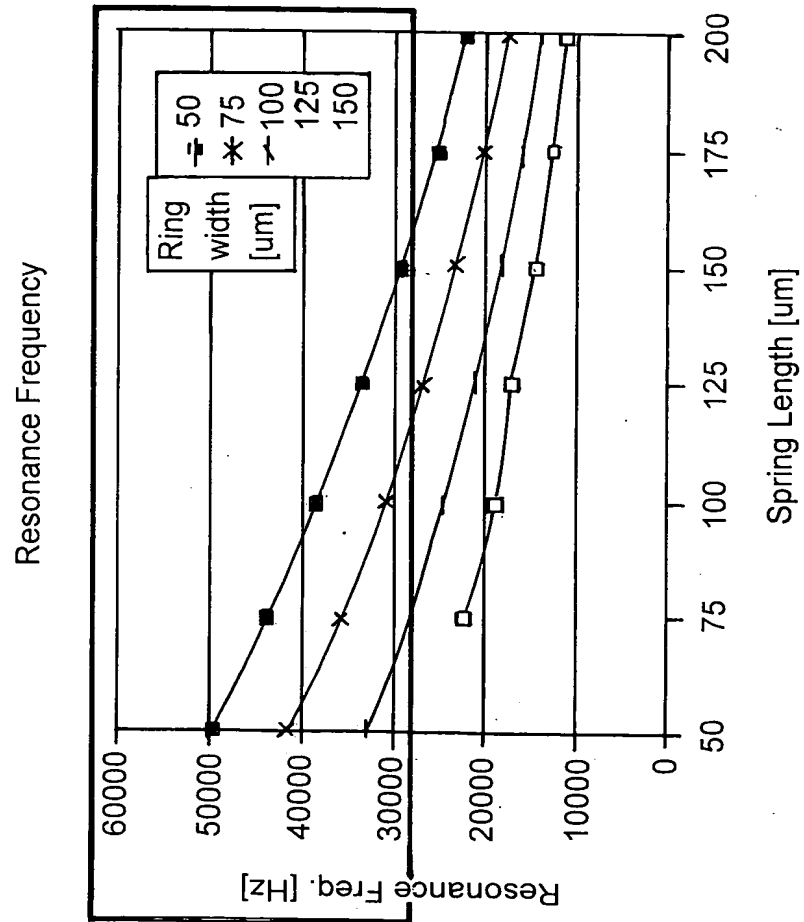


Fig. 19

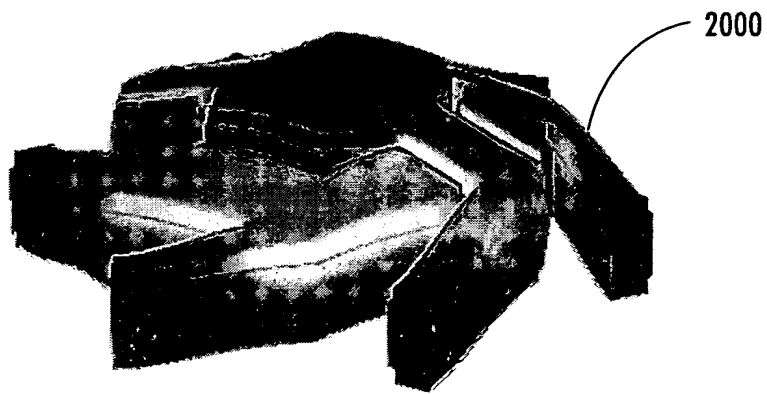


FIG. 20

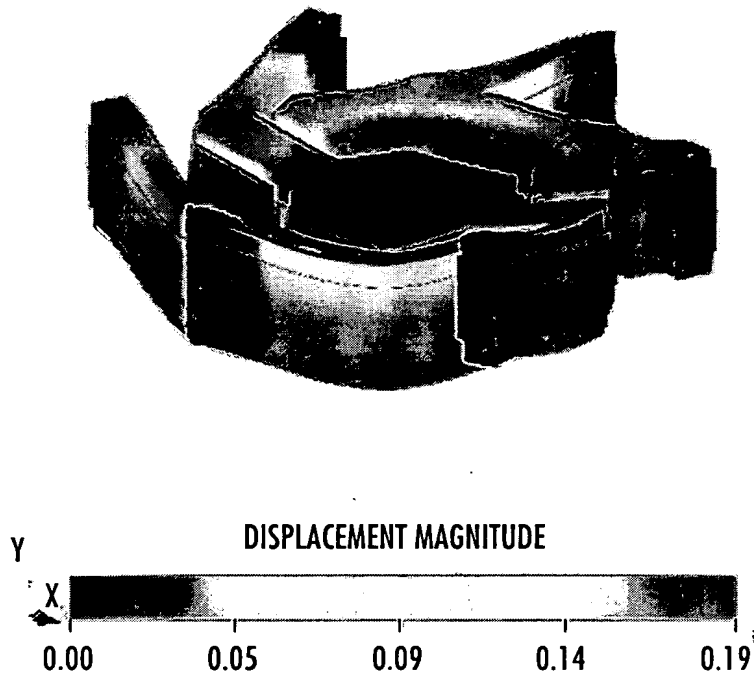


FIG. 21

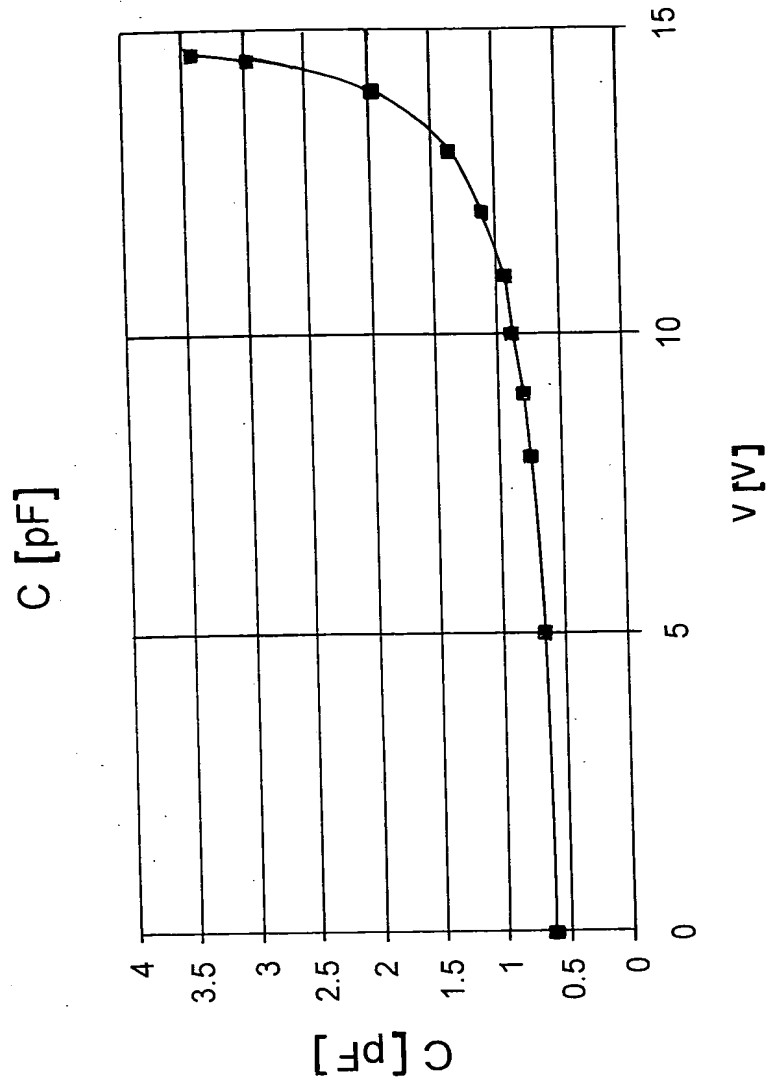


Fig. 22

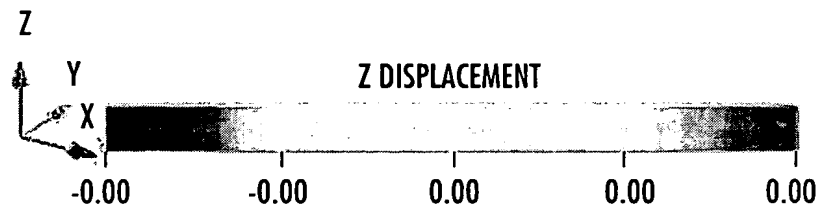
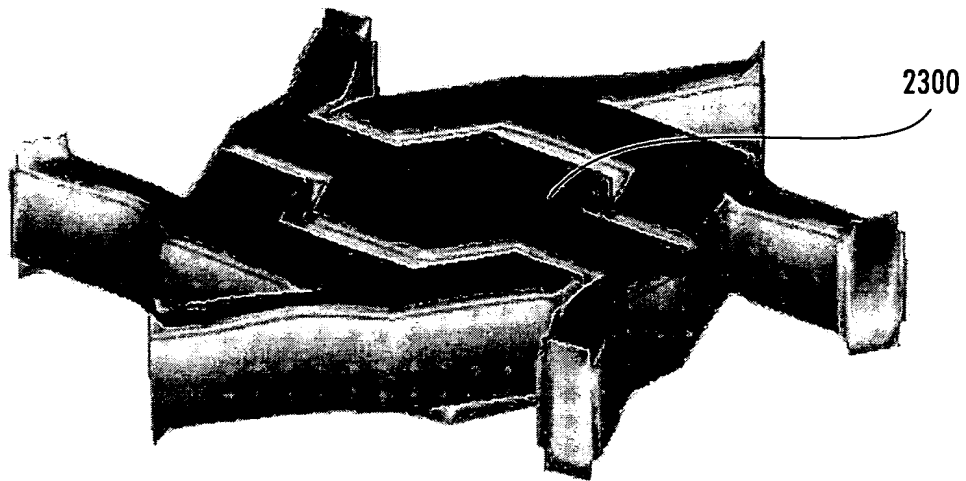


FIG. 23

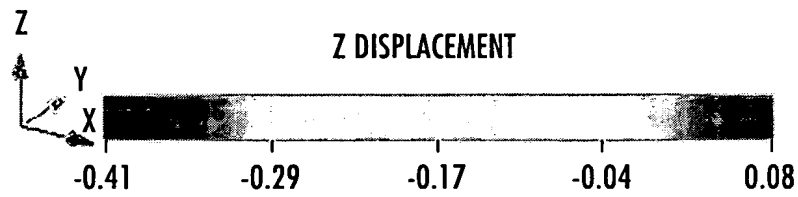
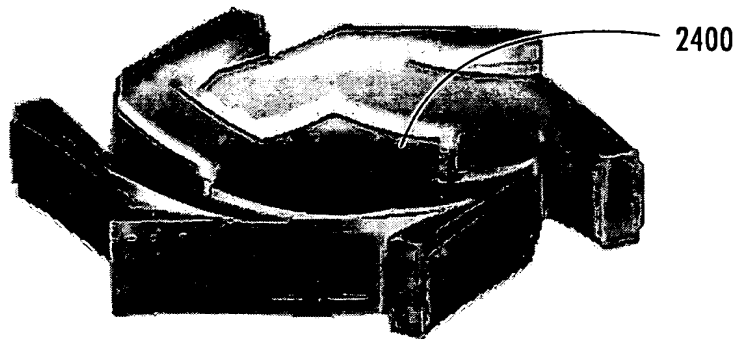


FIG. 24

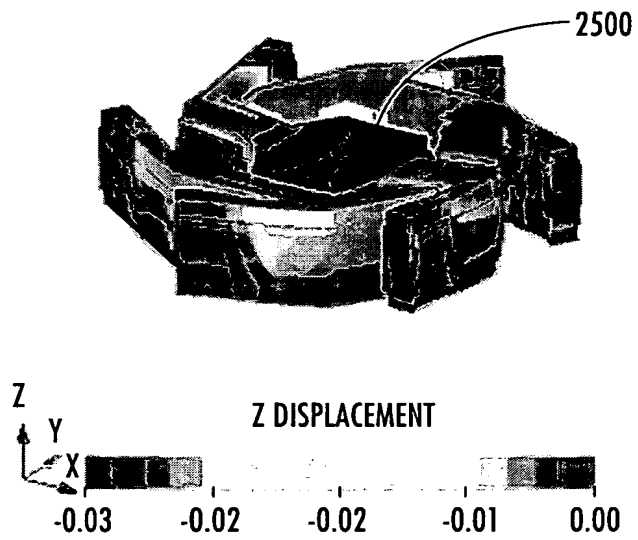


FIG. 25

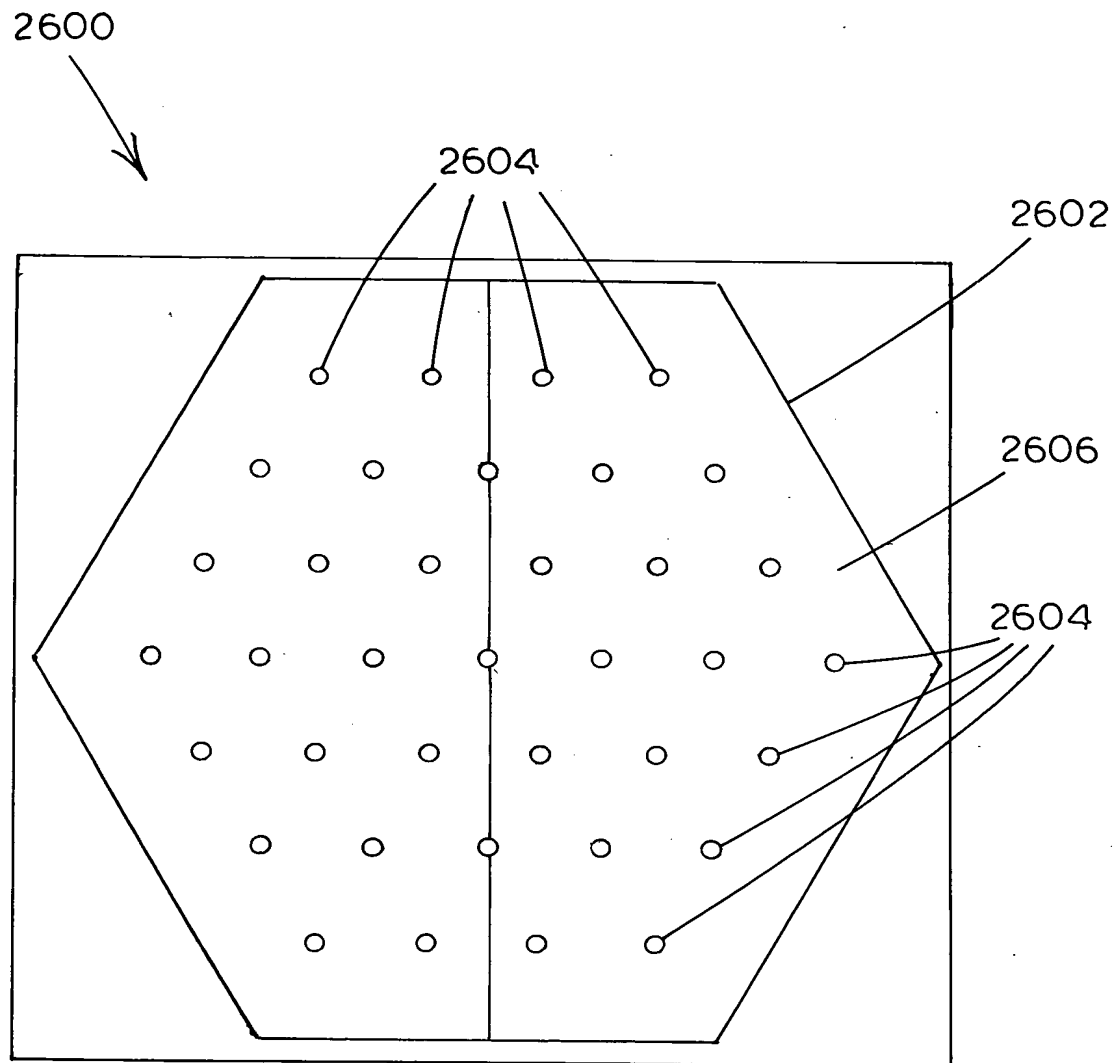


Fig. 26

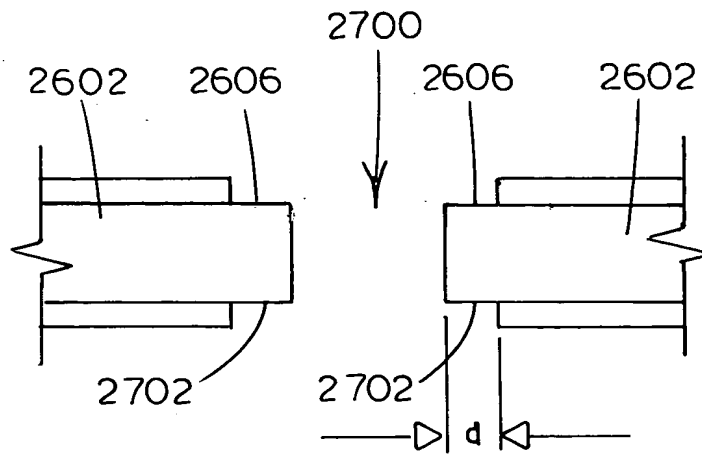


FIG. 27A

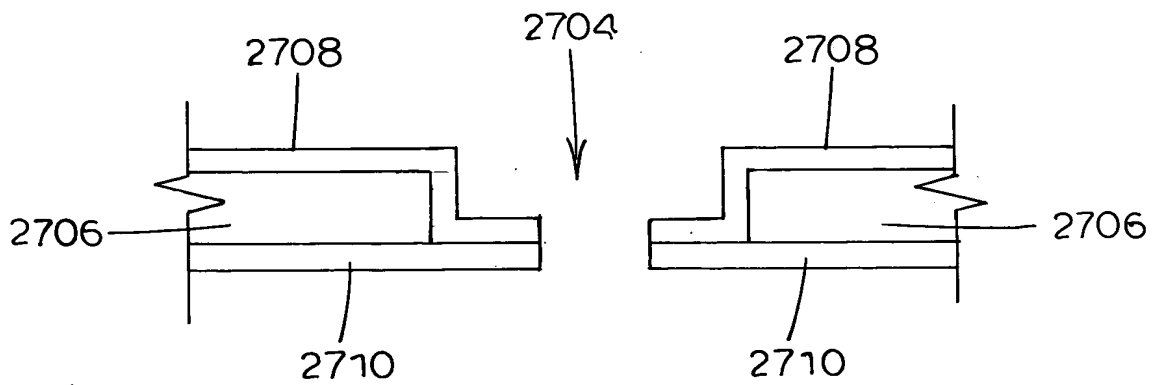


FIG. 27B

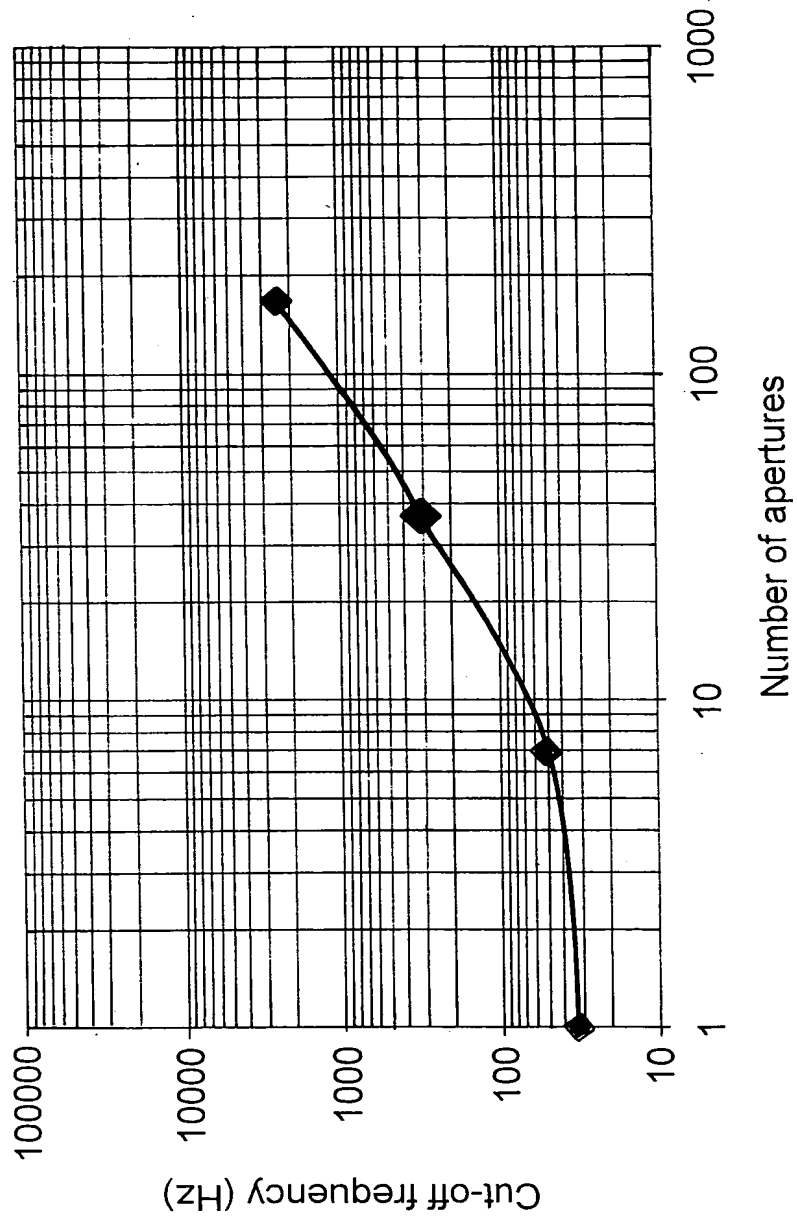


Fig. 28

Damping and spring forces

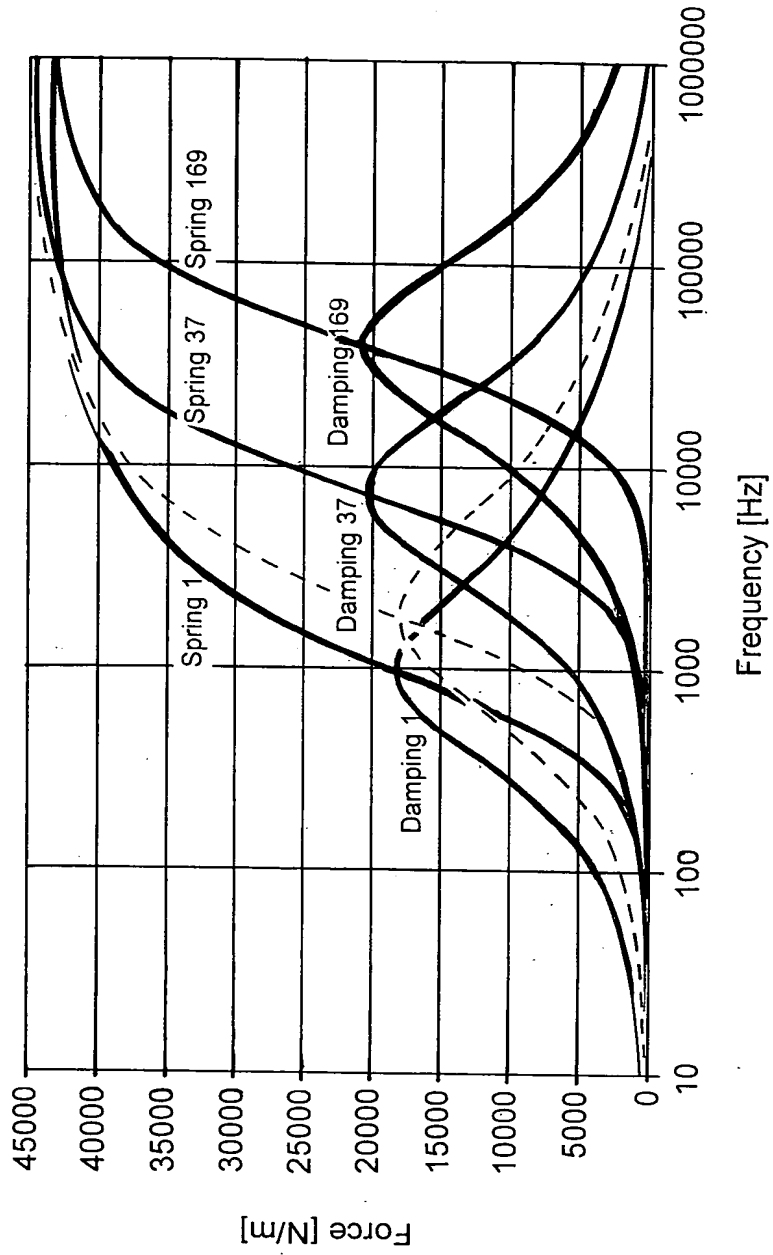


Fig. 29

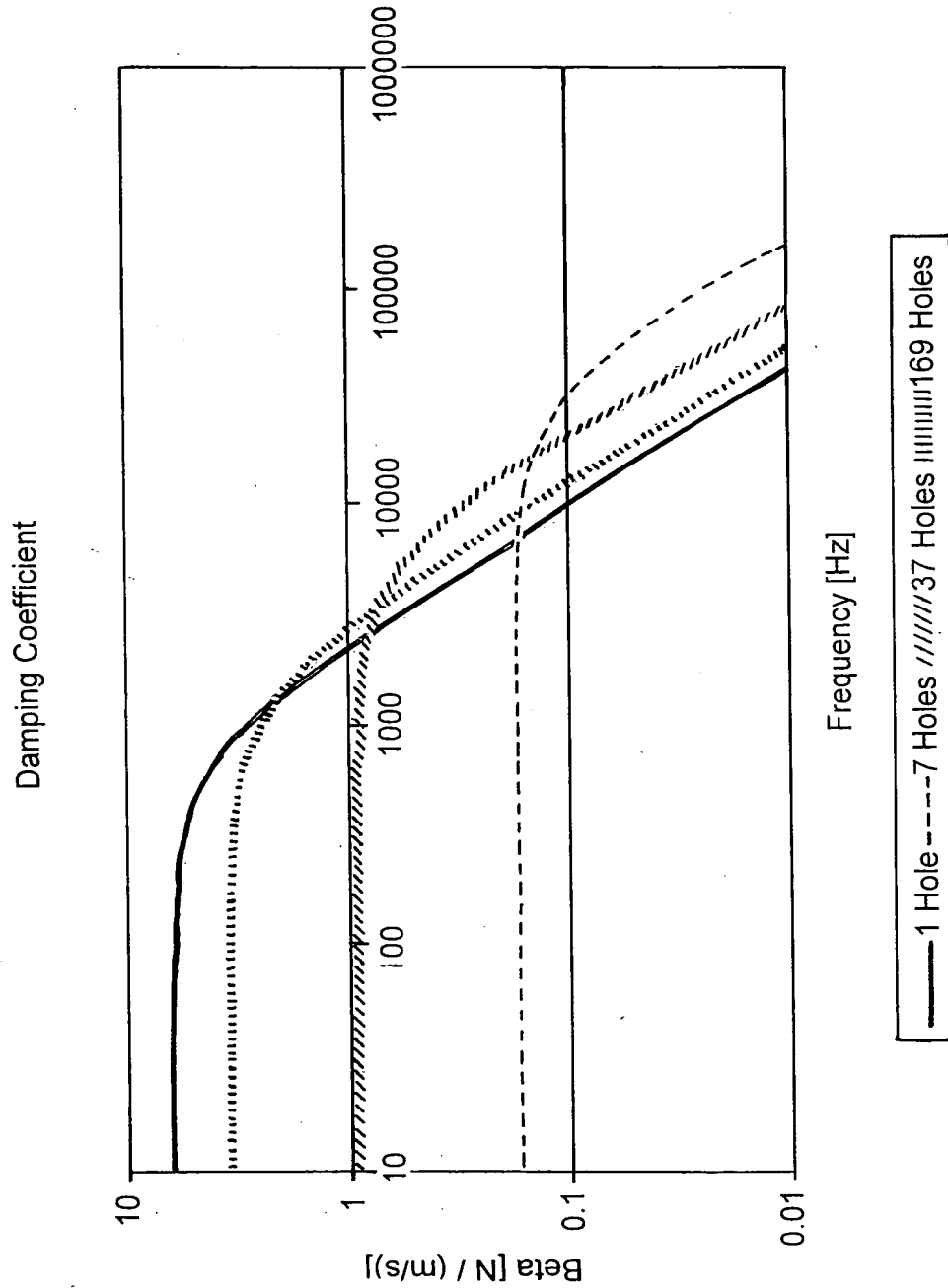


Fig. 30

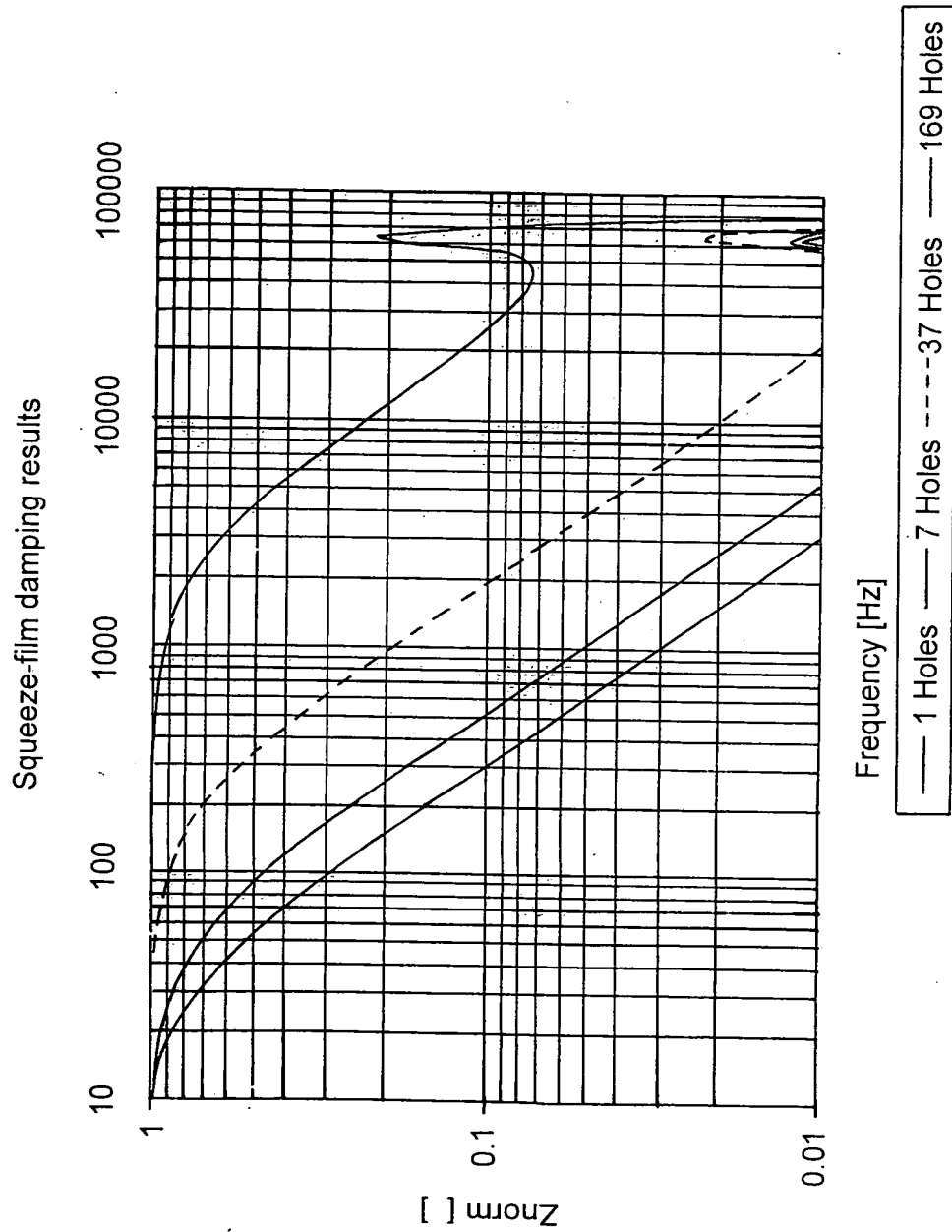


Fig. 31

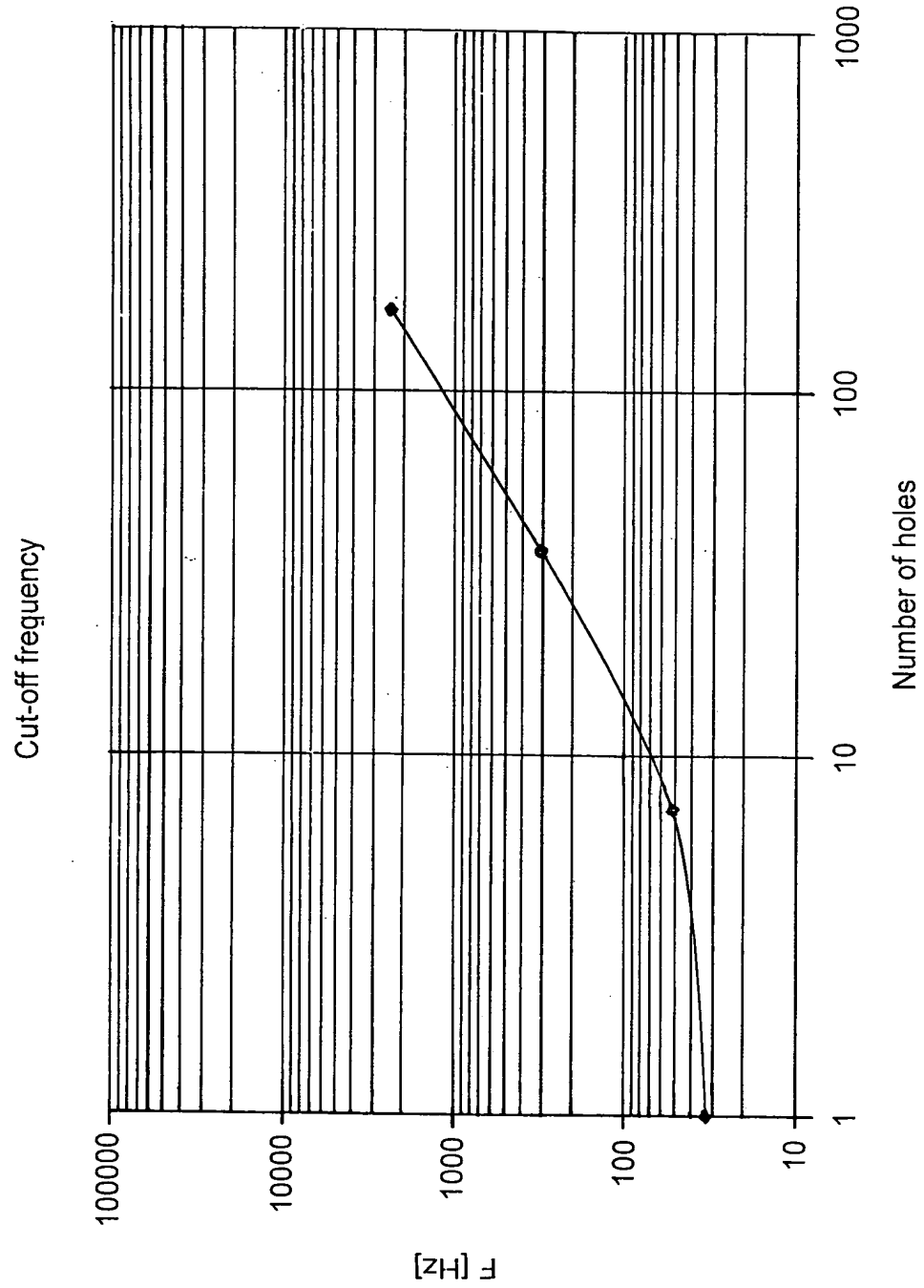


Fig. 32

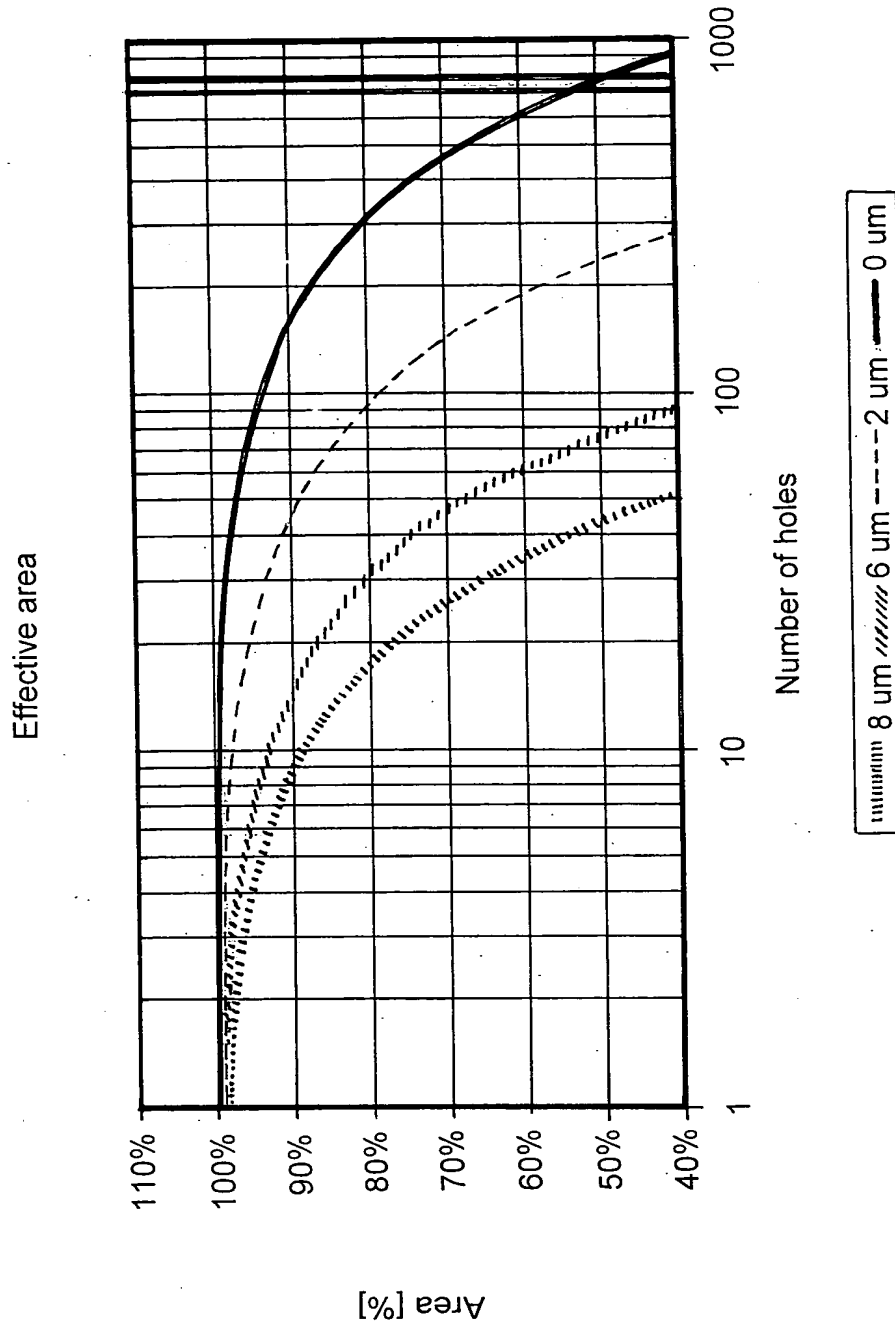


Fig. 33

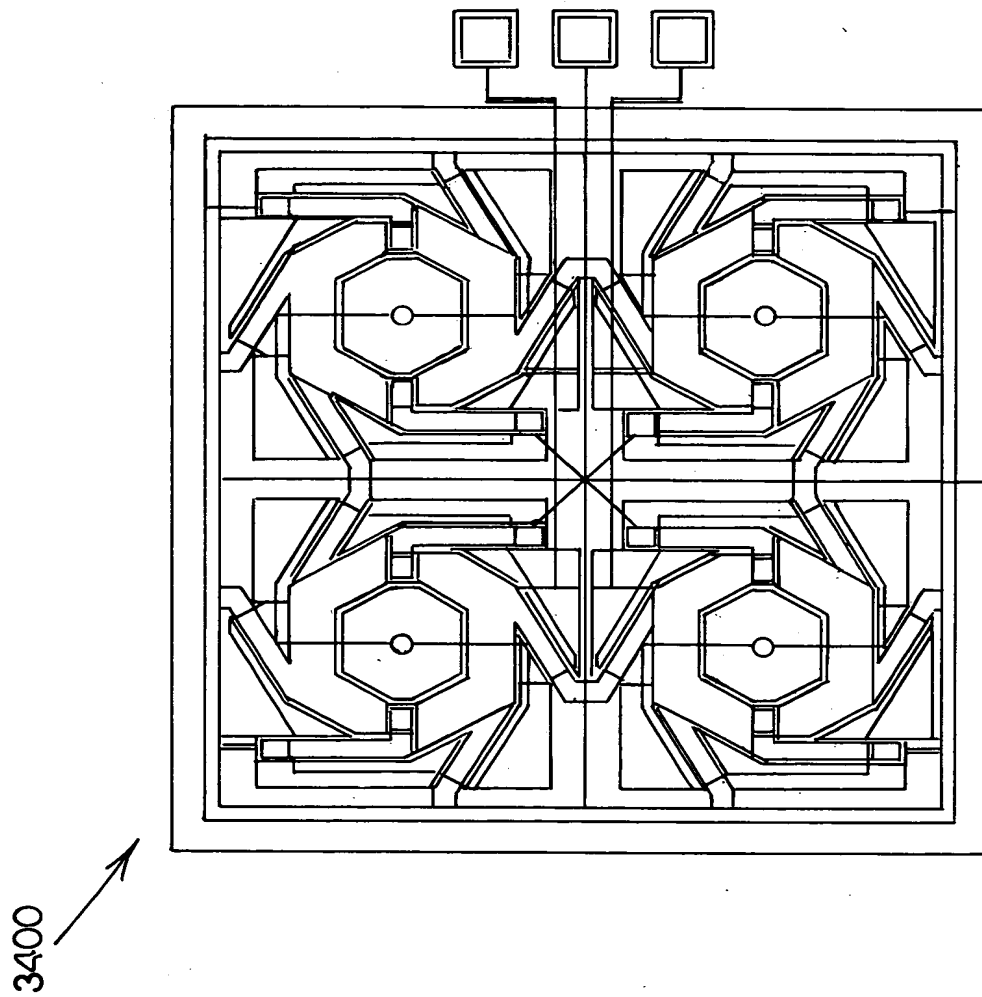


Fig. 34

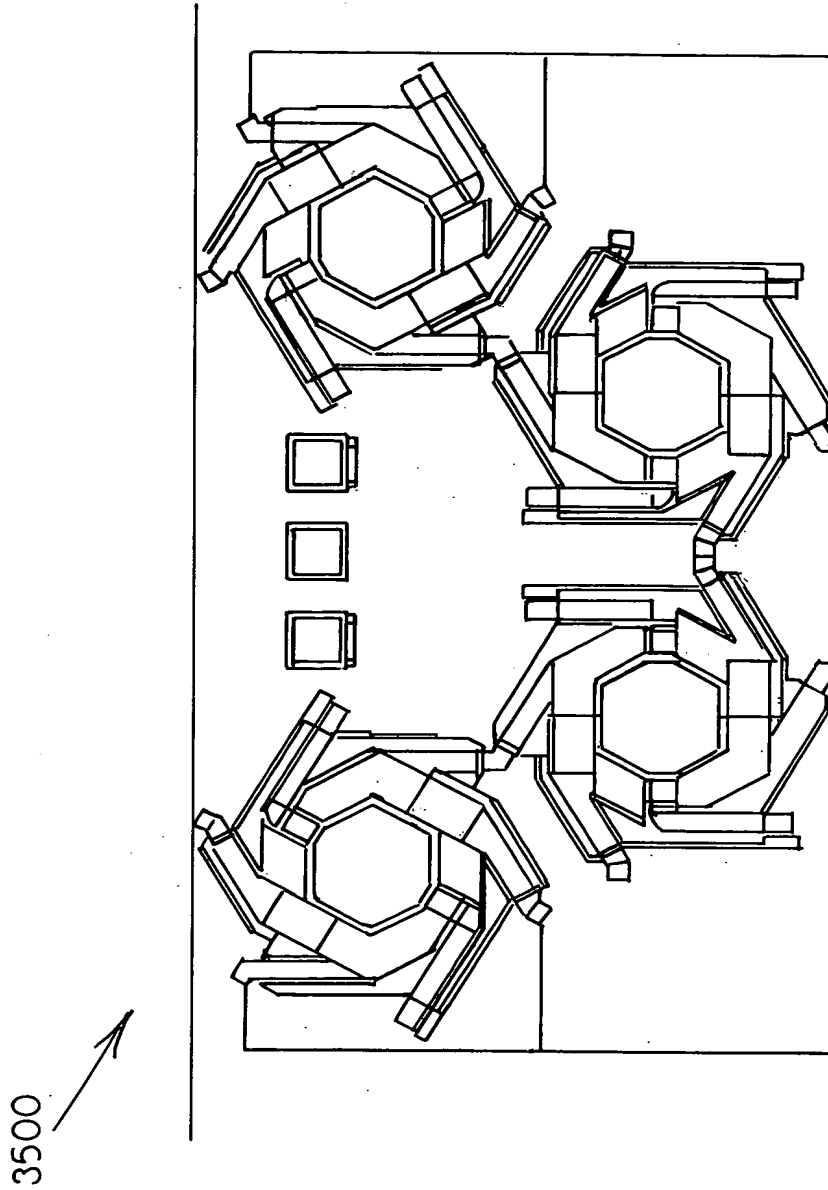


Fig. 35

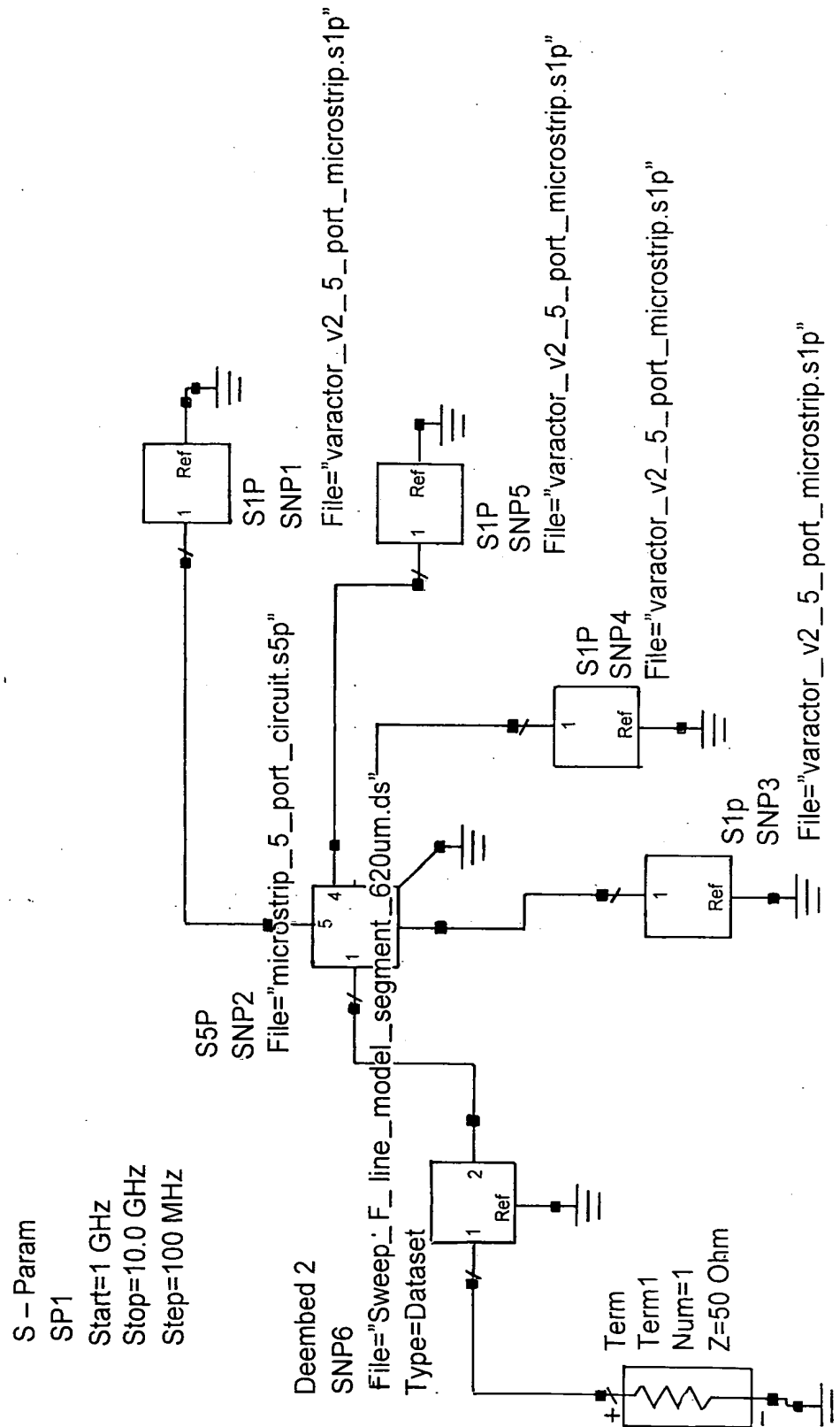
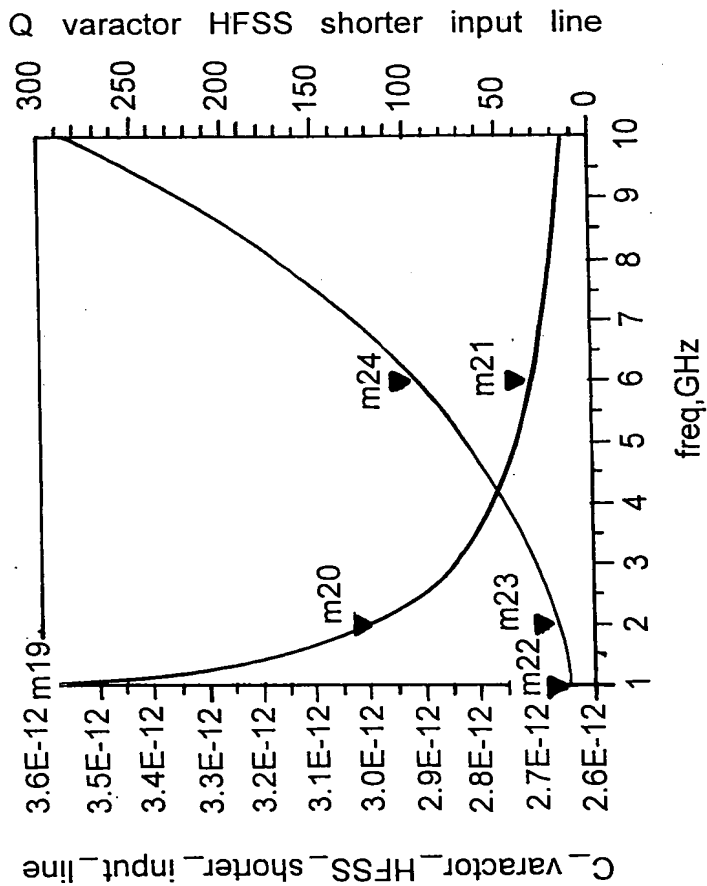


Fig. 36A

Eqn $Z_{\text{varactor_HFSS_shorter_input_line}} = \text{stoz}(\text{Test_quad_varactor_shorter_input_line}, S11)$

Eqn $C_{\text{varactor_HFSS_shorter_input_line}} = \text{im}(\text{Test_quad_varactor_shorter_input_line}, Y(1,1)/(2 \cdot \pi \cdot \text{freq}))$

Eqn $Q_{\text{varactor_HFSS_shorter_input_line}} = -\text{im}(Z_{\text{varactor_HFSS_shorter_input_line}}) / \text{re}(Z_{\text{varactor_HFSS_shorter_input_line}})$



m19
freq=1.000GHz
Q varactor HFSS shorter input line=276.0

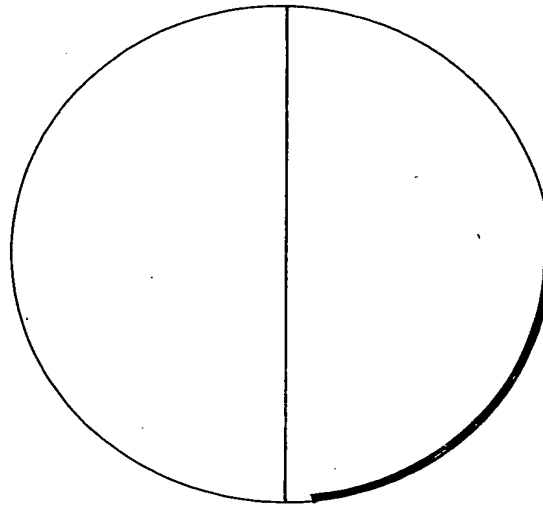
M20
freq=2.000GHz
Q varactor HFSS shorter input line=117.4

m21
freq=6.000GHz
Q varactor HFSS shorter input line=32.0

Fig. 36B

m22 freq=1.000GHz C_varactor_HFSS_shorter_input_line=2.640E-
m23 freq=2.000GHz C_varactor_HFSS_shorter_input_line=2.663E-
m24 freq=6.000GHz C_varactor_HFSS_shorter_input_line=2.914E-

Test_quad_varactor_shorter_input_line..S(1,1)



freq (1.000GHz to 10.00GHz)

Fig. 36C

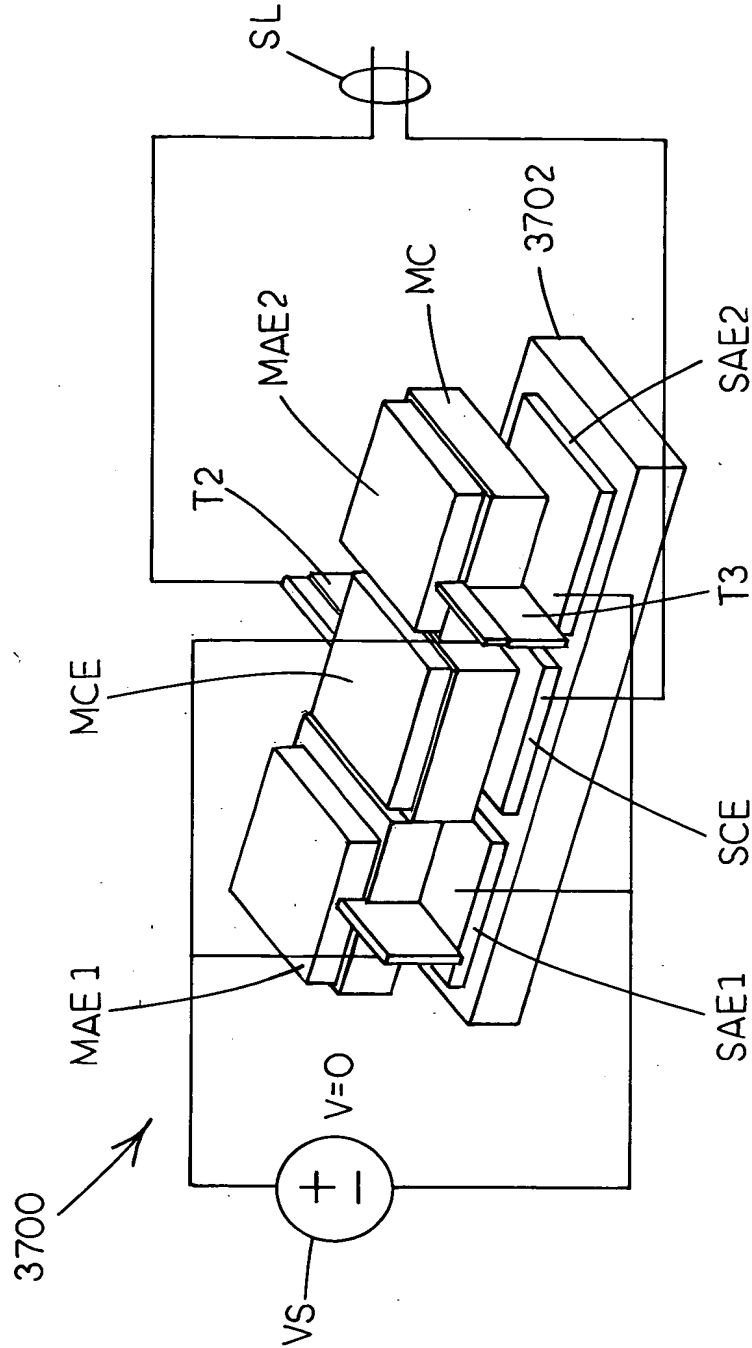


Fig. 37A

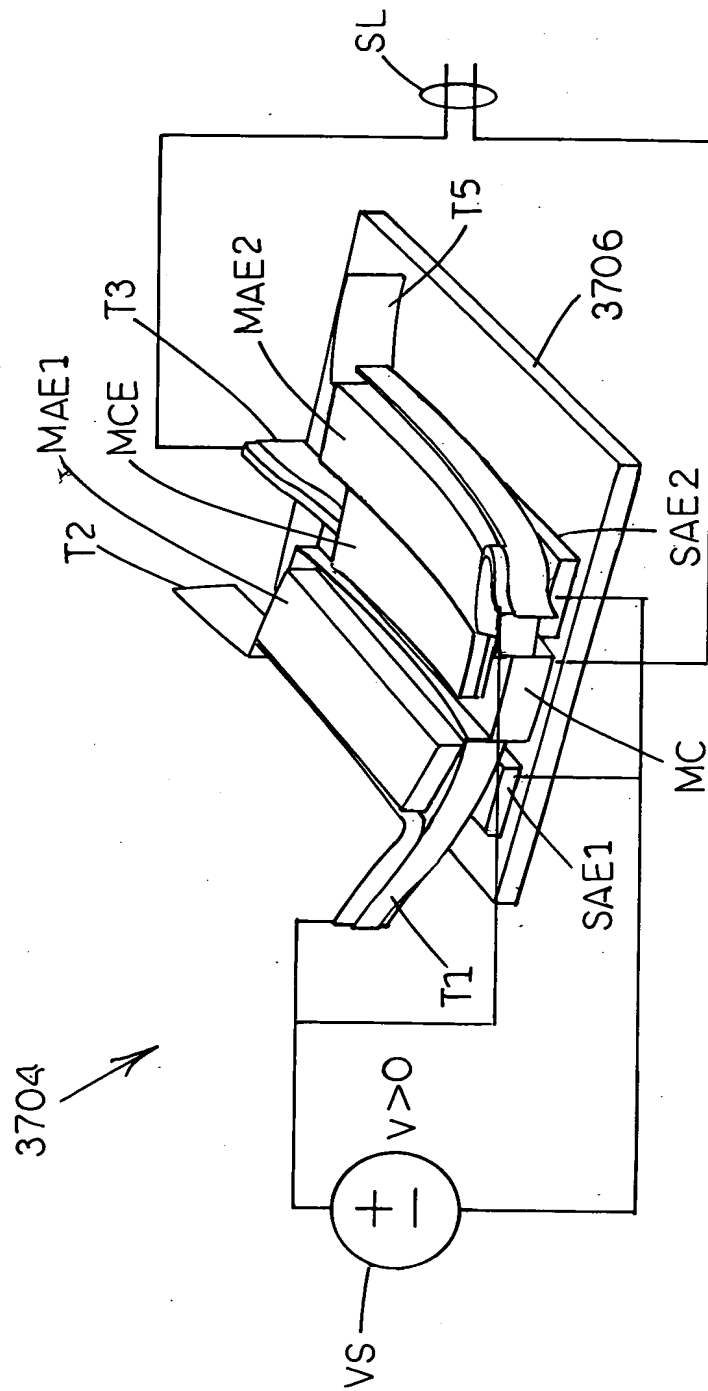


Fig. 37B

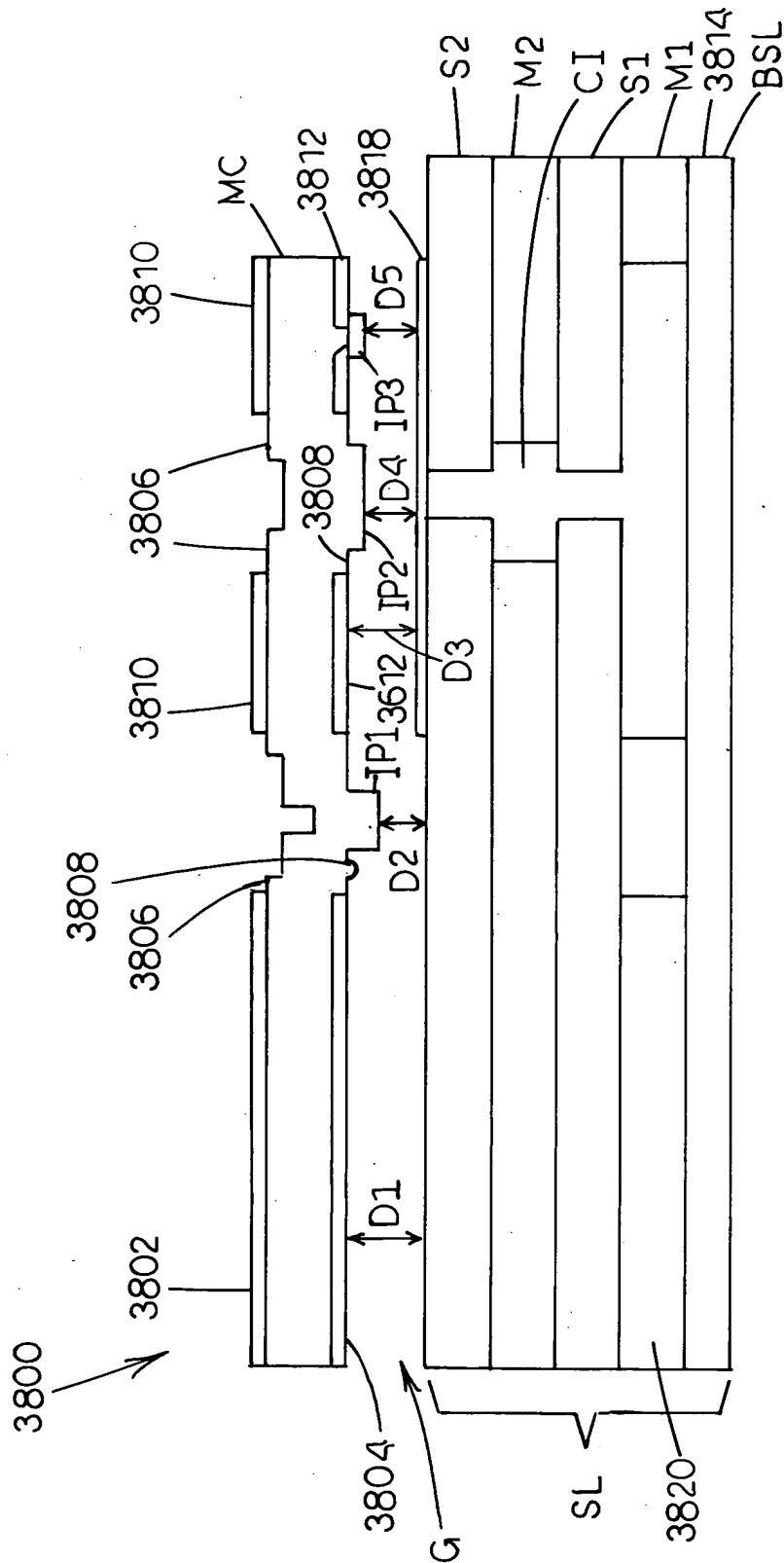


Fig. 38

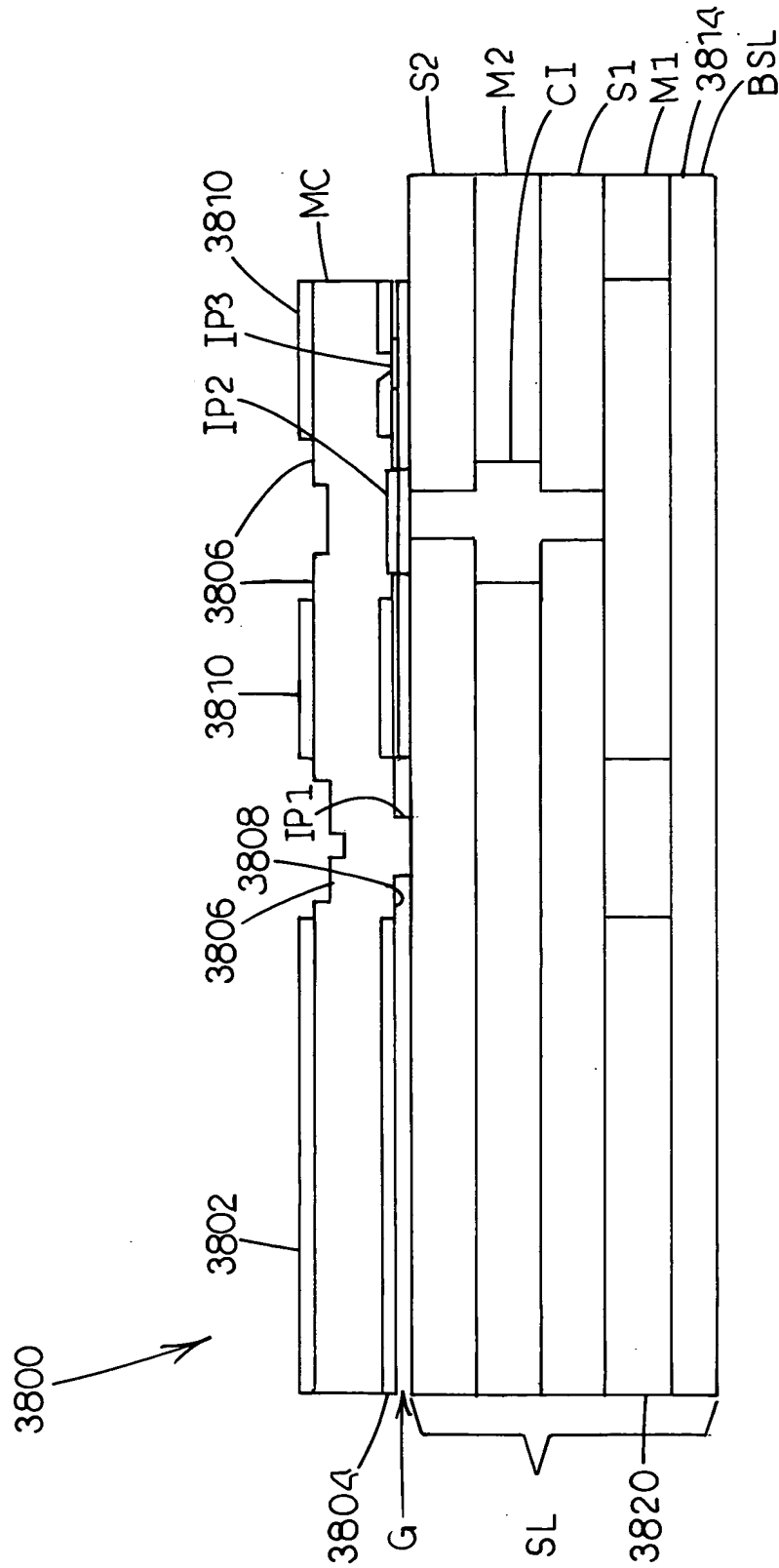


Fig. 39.

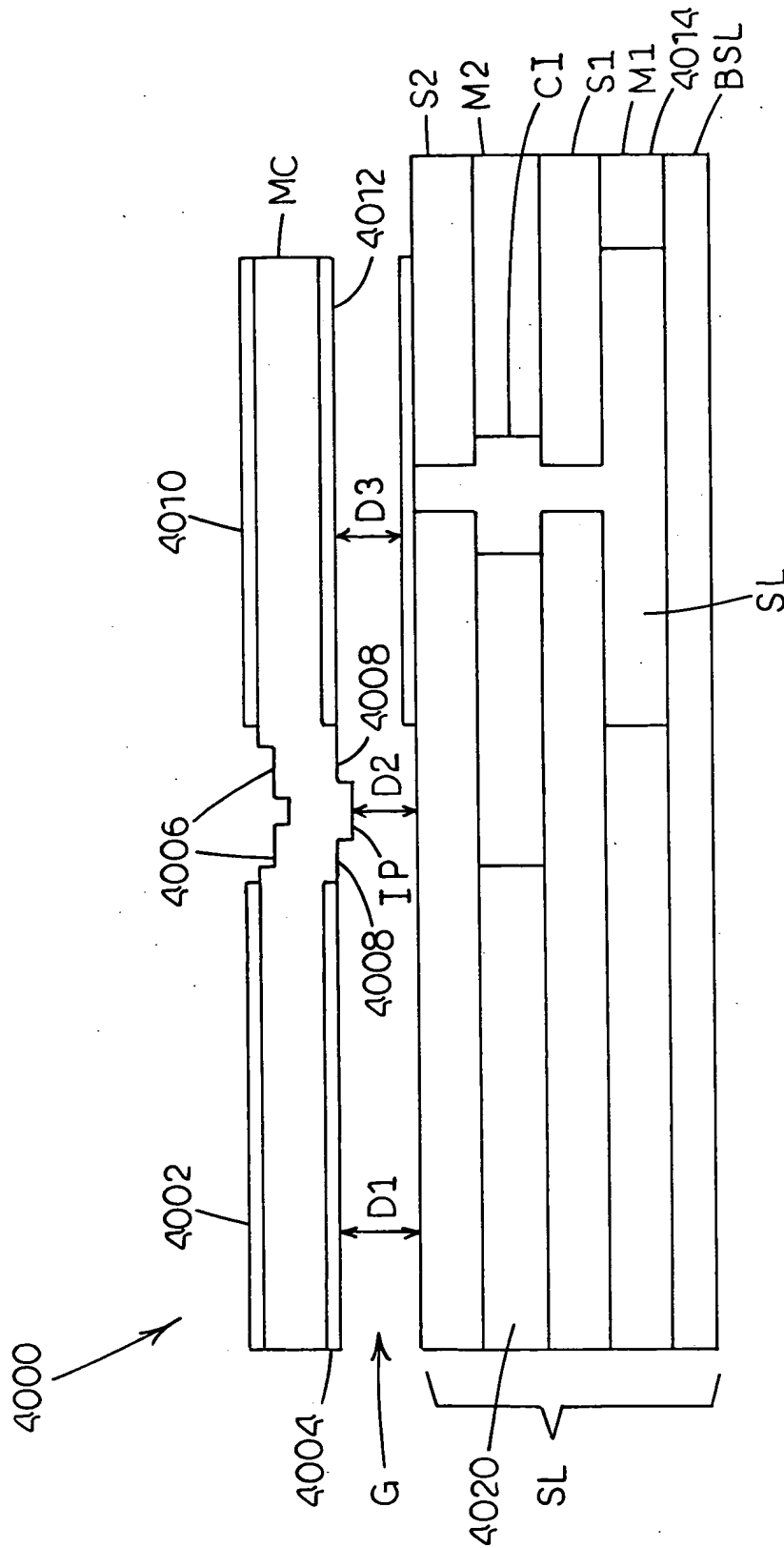


Fig. 40

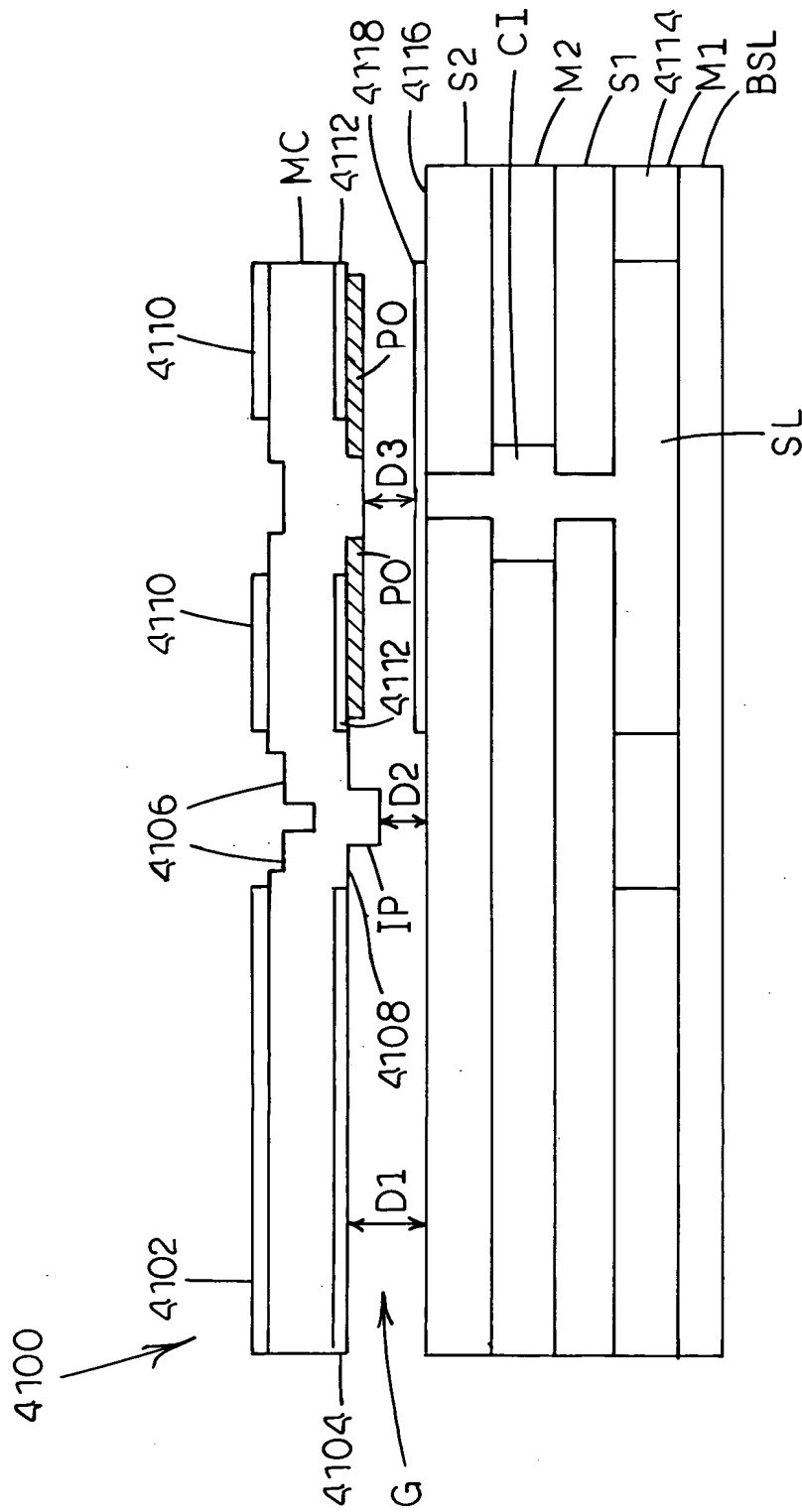


Fig. 41

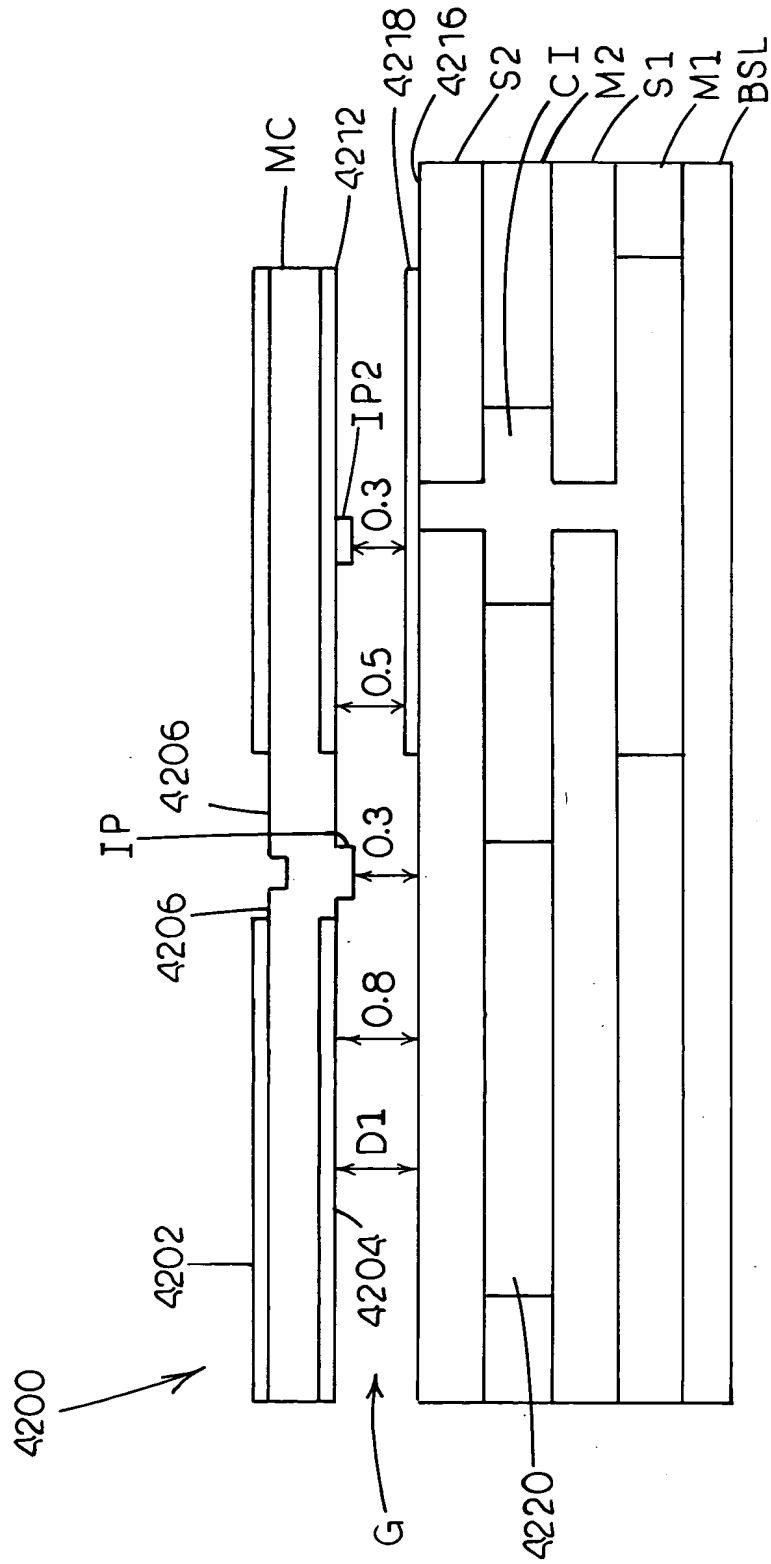


Fig. 42

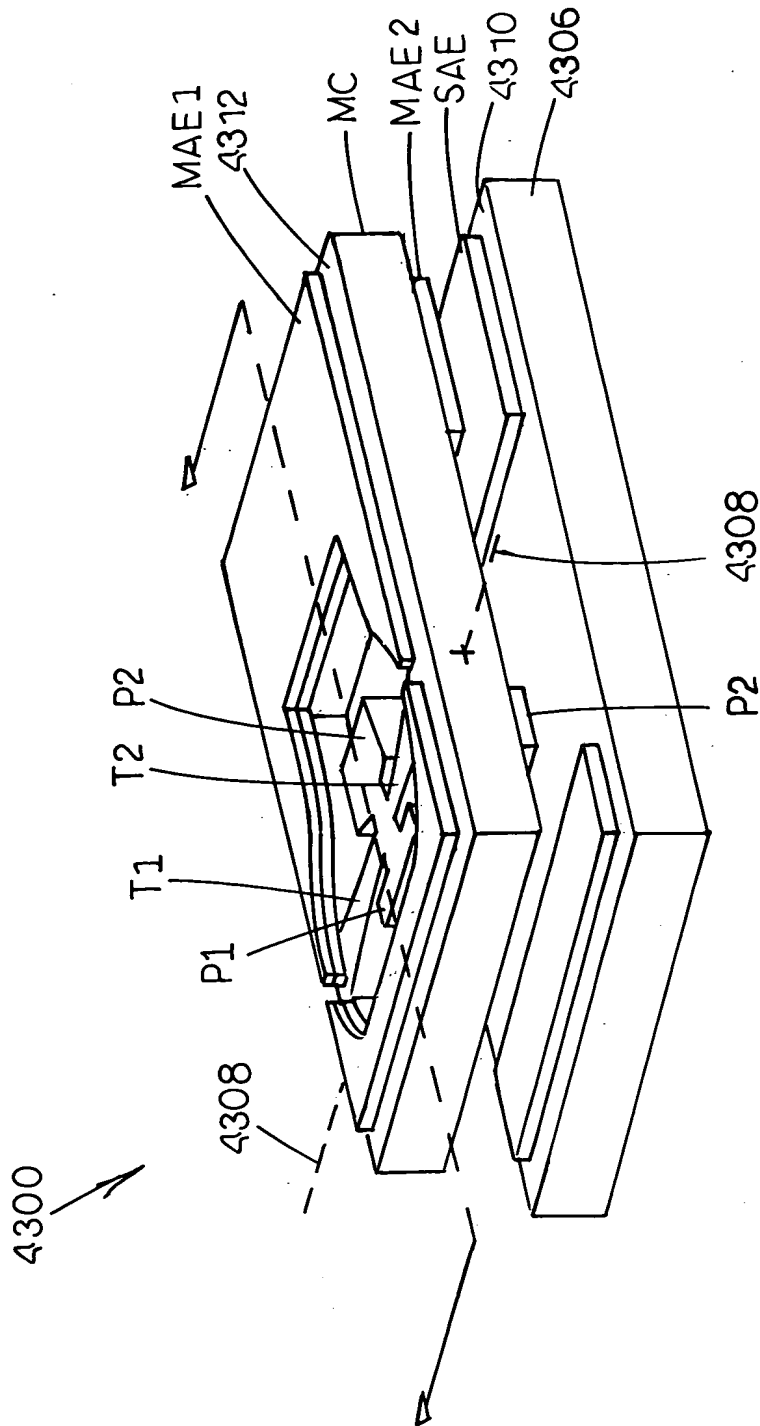


Fig. 43

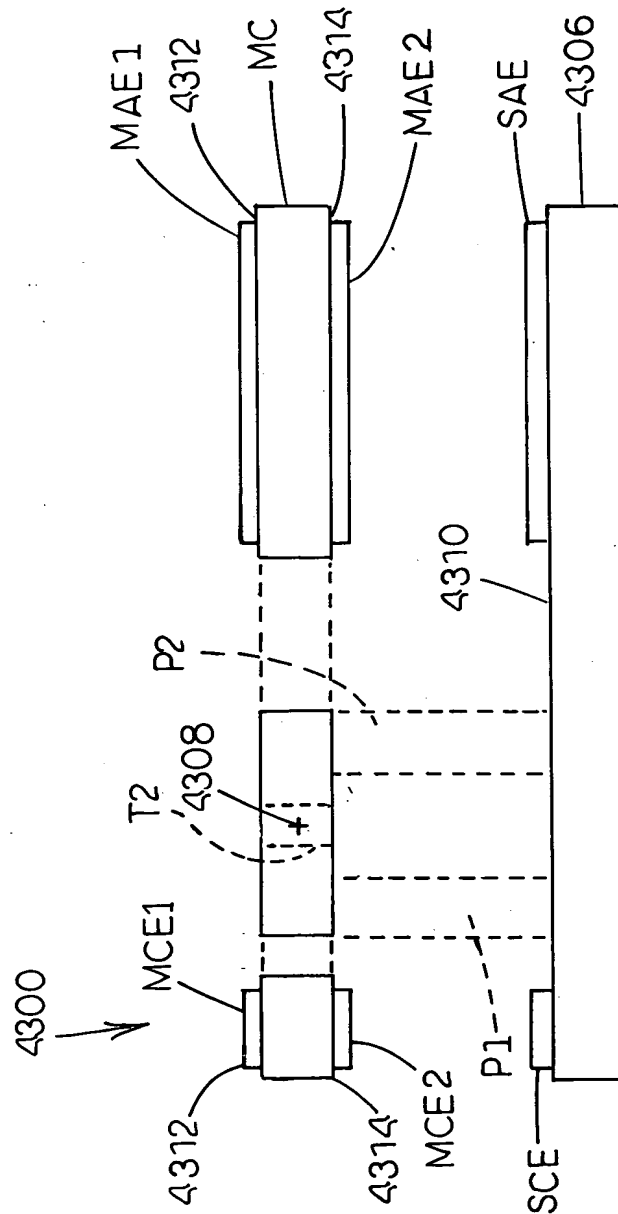


Fig. 44A

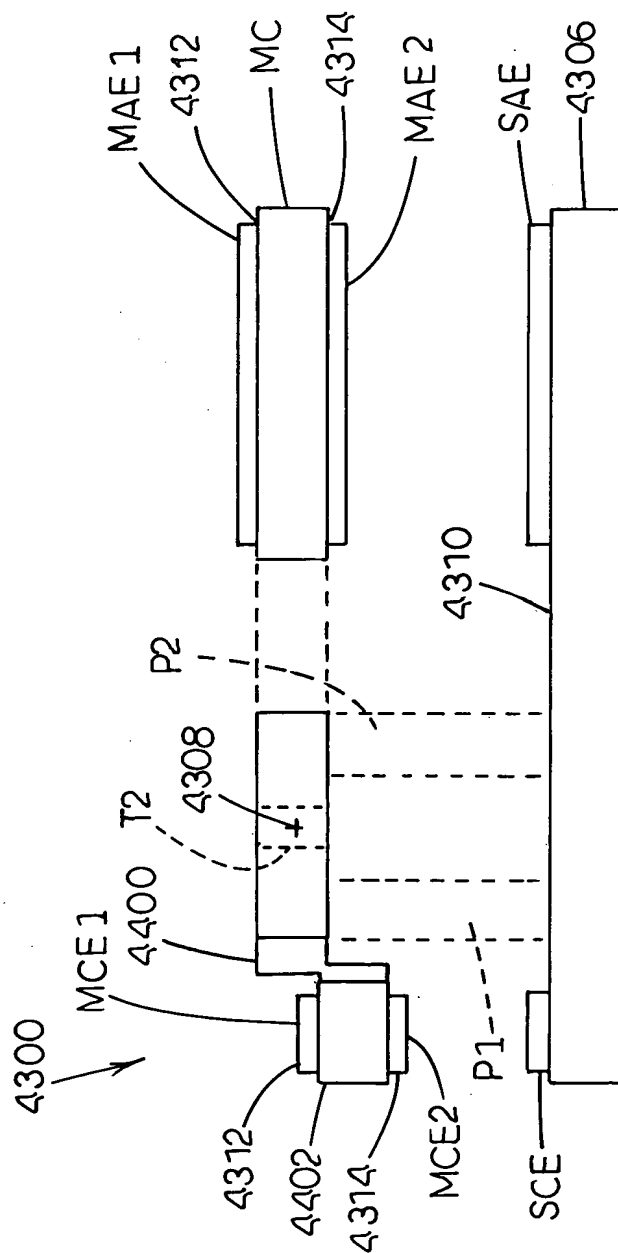


Fig. 44B

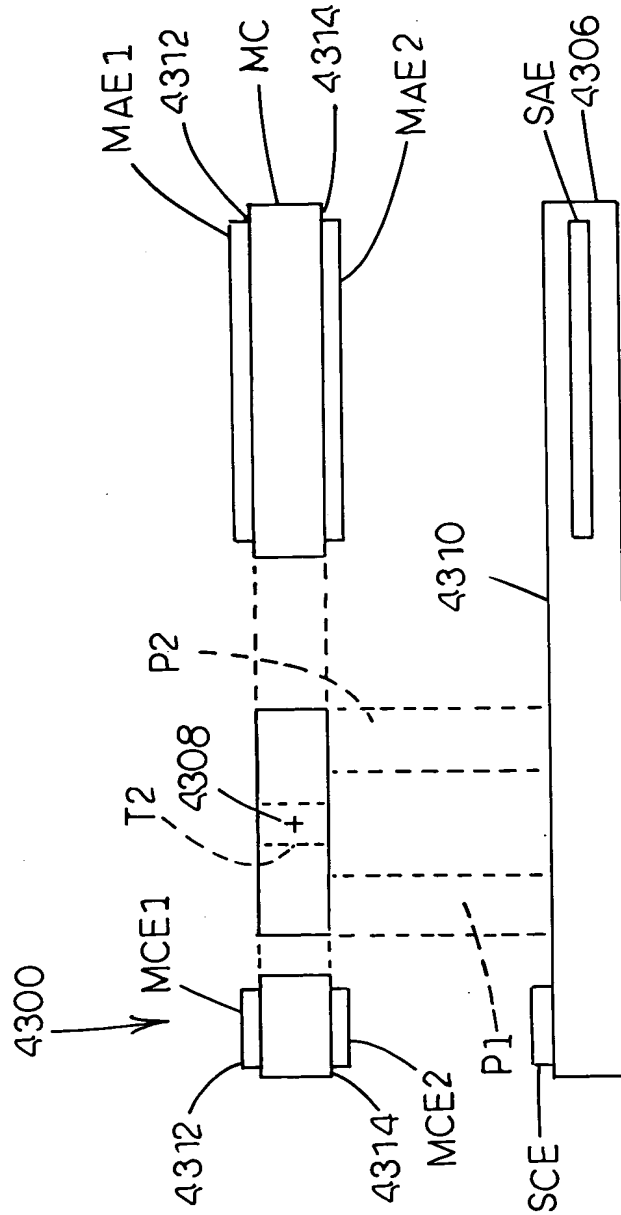
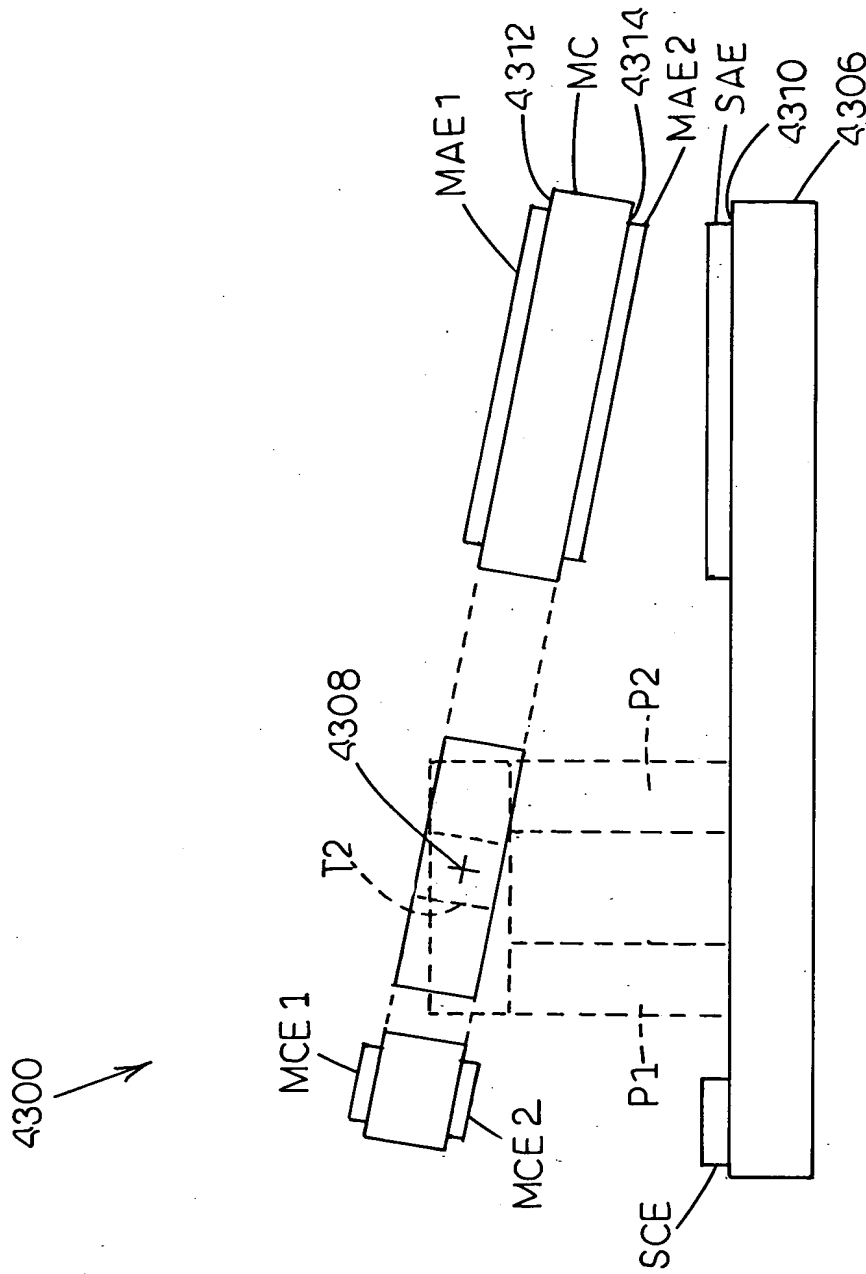


Fig. 44C



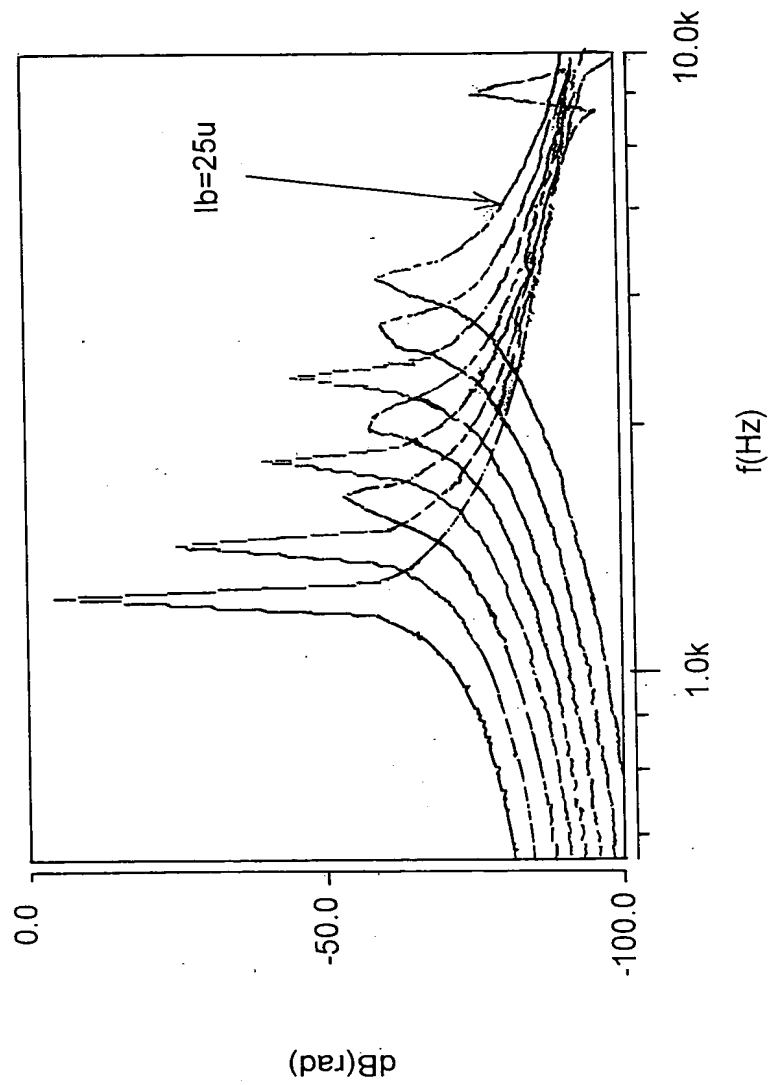


Fig. 46

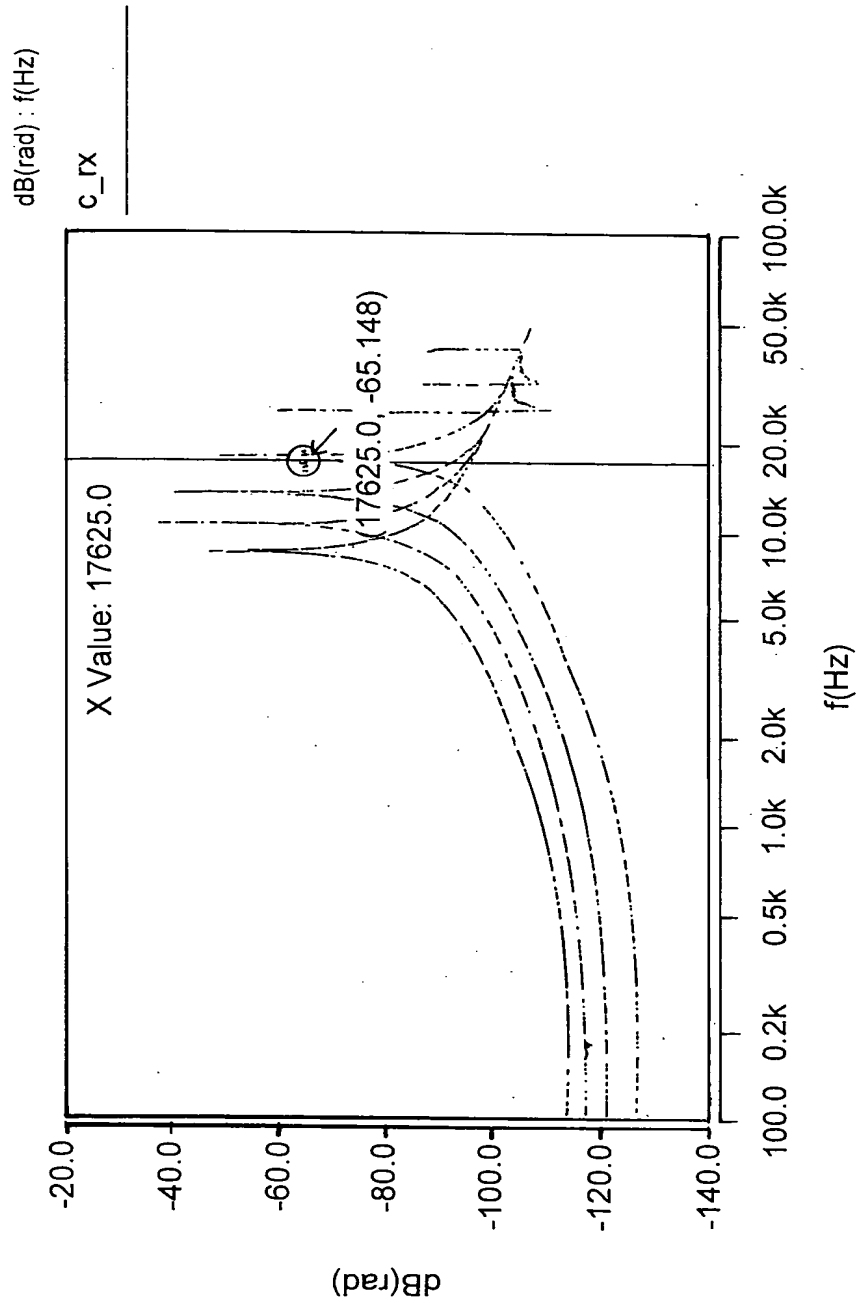


Fig. 47

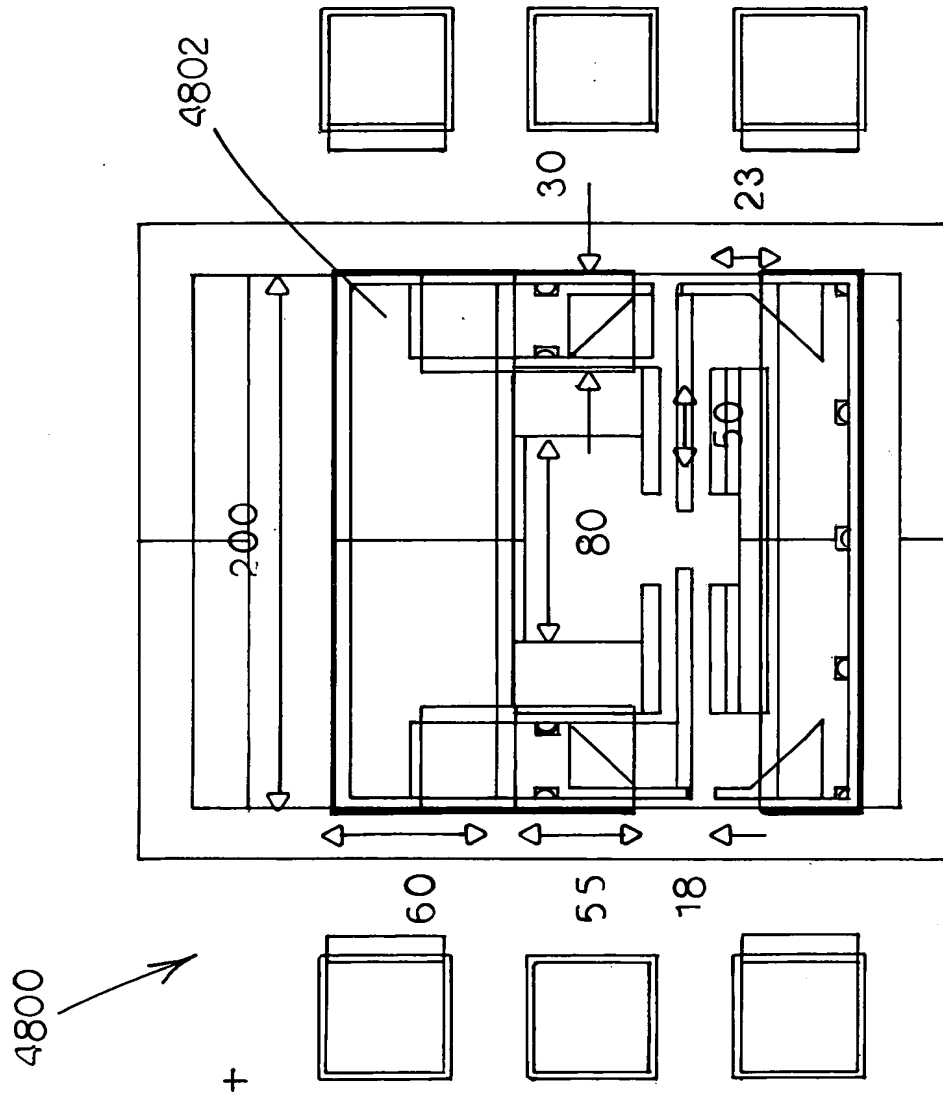


Fig. 48

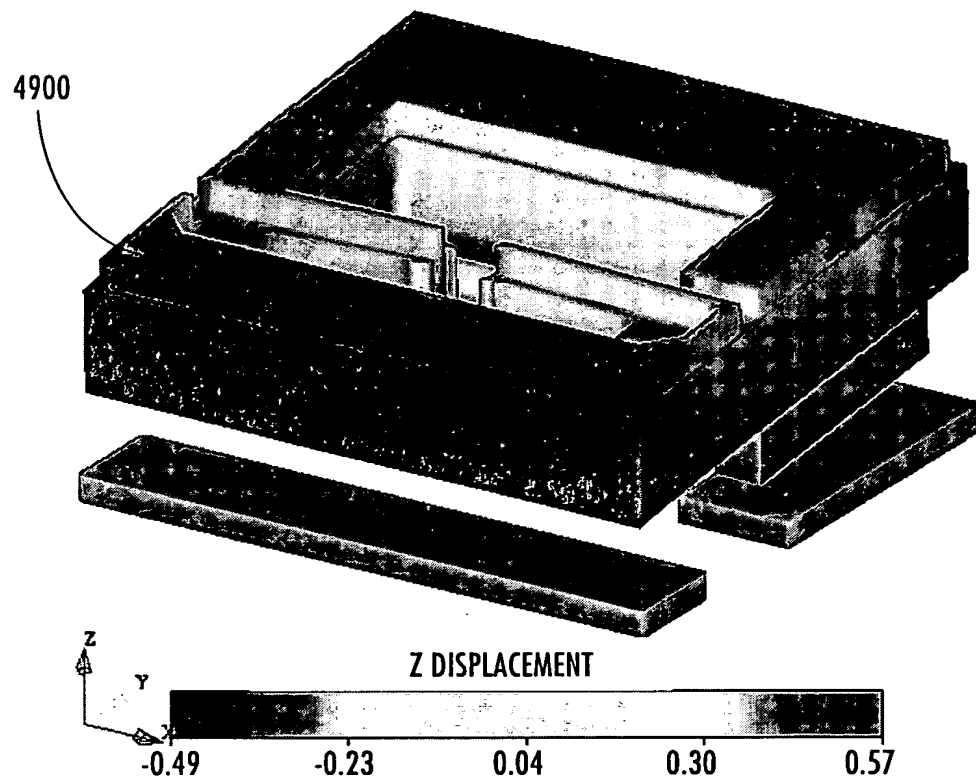


FIG. 49

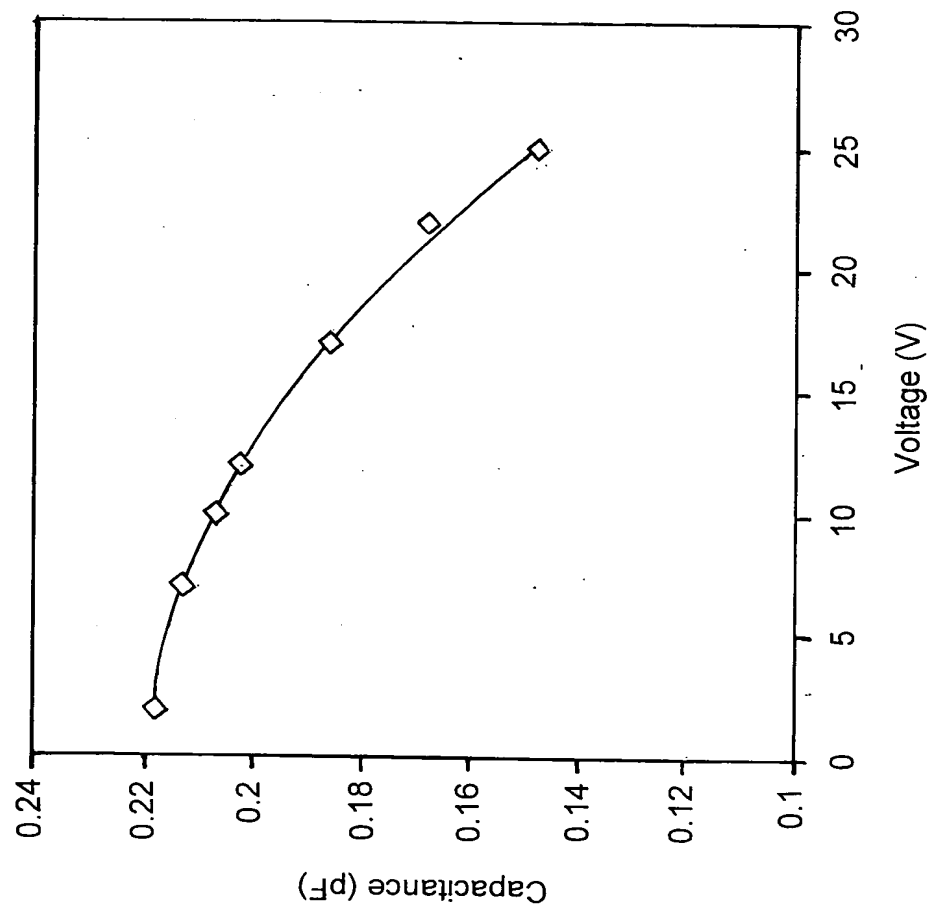


Fig. 50

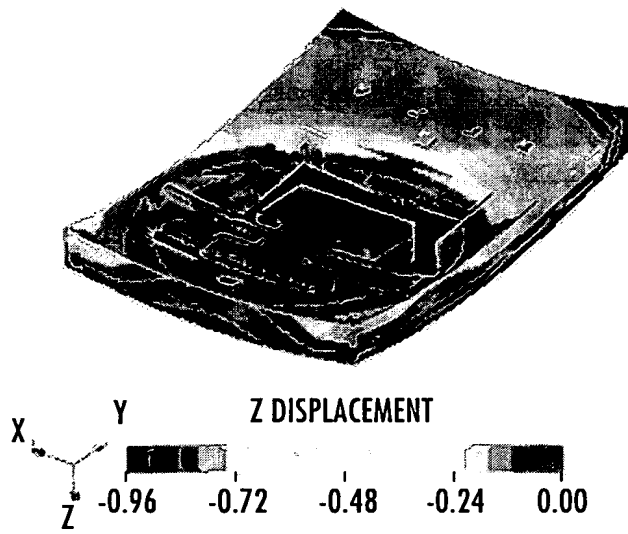


FIG. 51

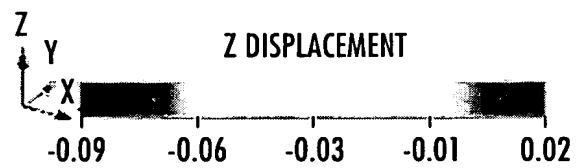
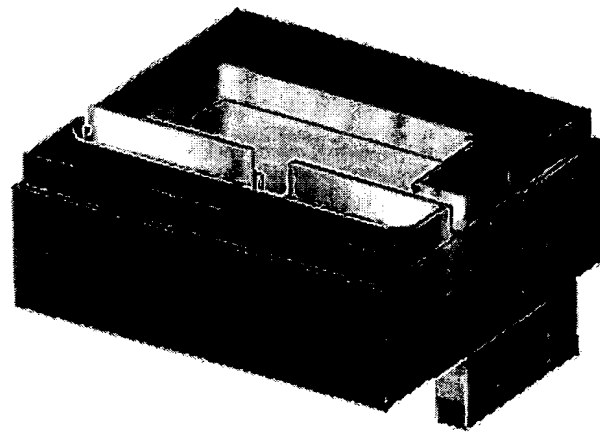


FIG. 52

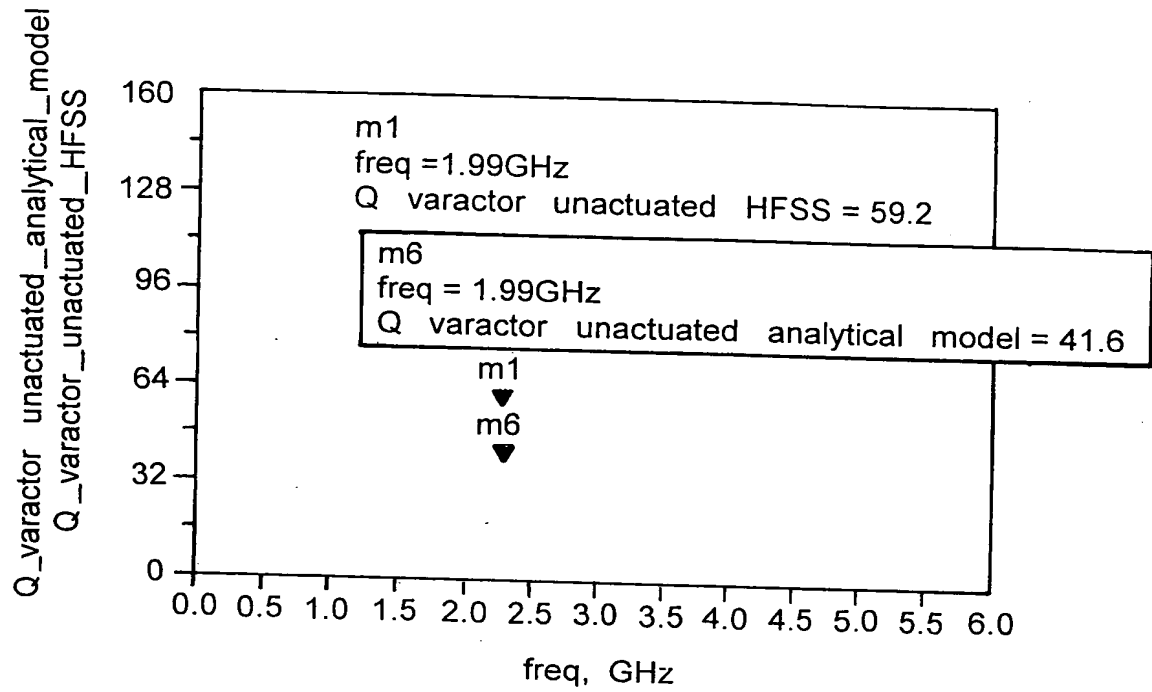


Fig. 53A

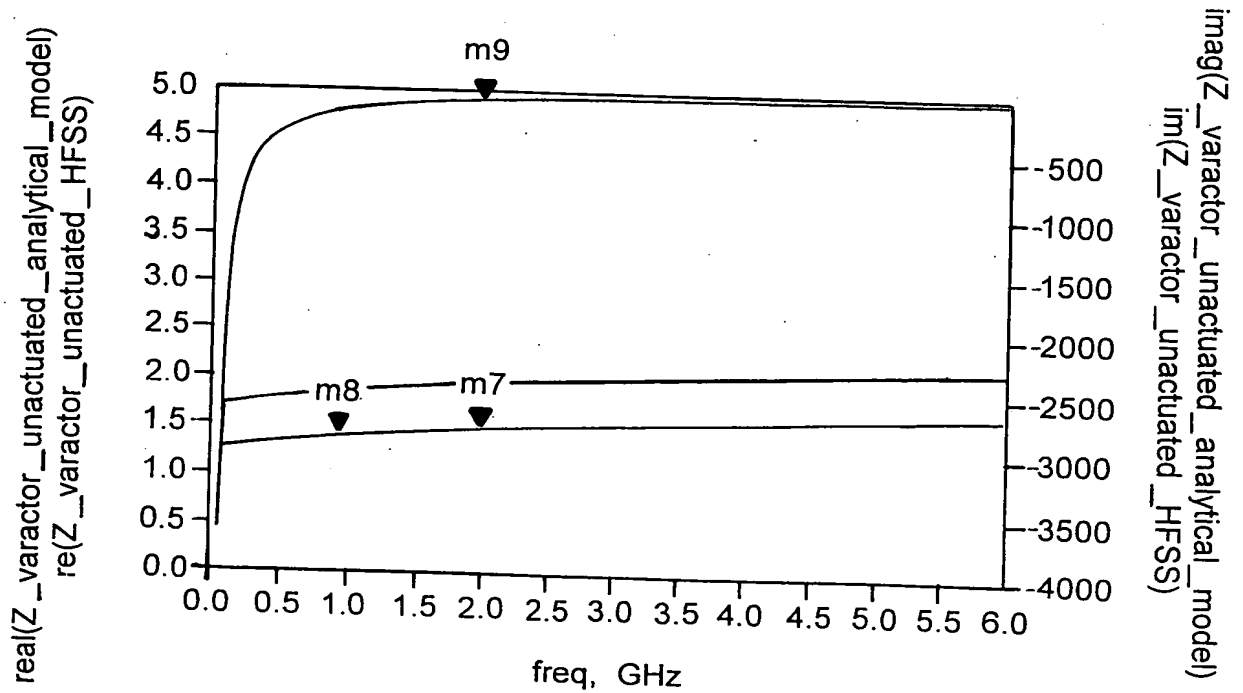
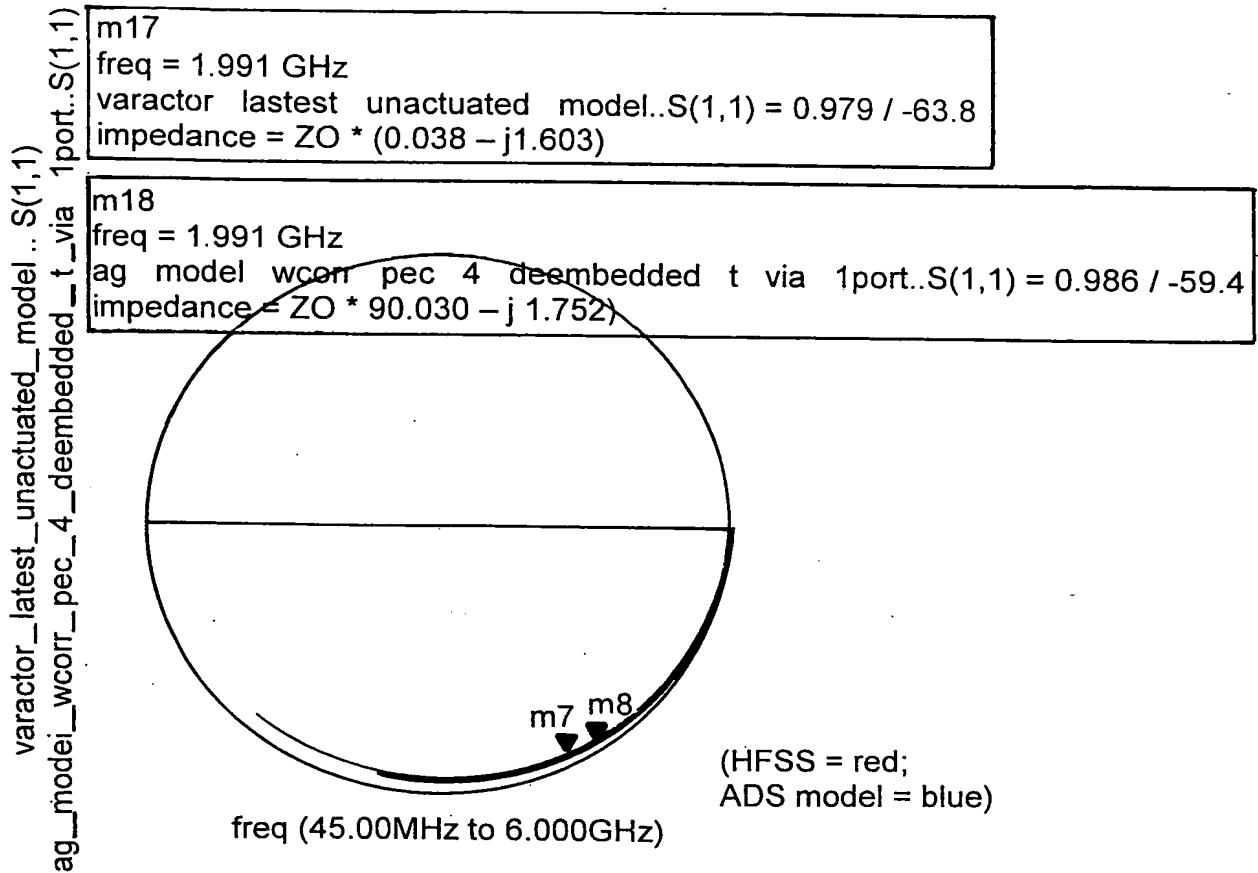


Fig. 53B



m7
 freq = 1.991 GHz
 re(Z varactor unactuated HFSS) = 1.47

m8
 freq = 929.4 MHz
 re(Z varactor unactuated HFSS) = 1.40

m9
 freq = 1.991 GHz
 im(Z varactor unactuated HFSS) = -87.58

Fig. 53c